

FIG.1

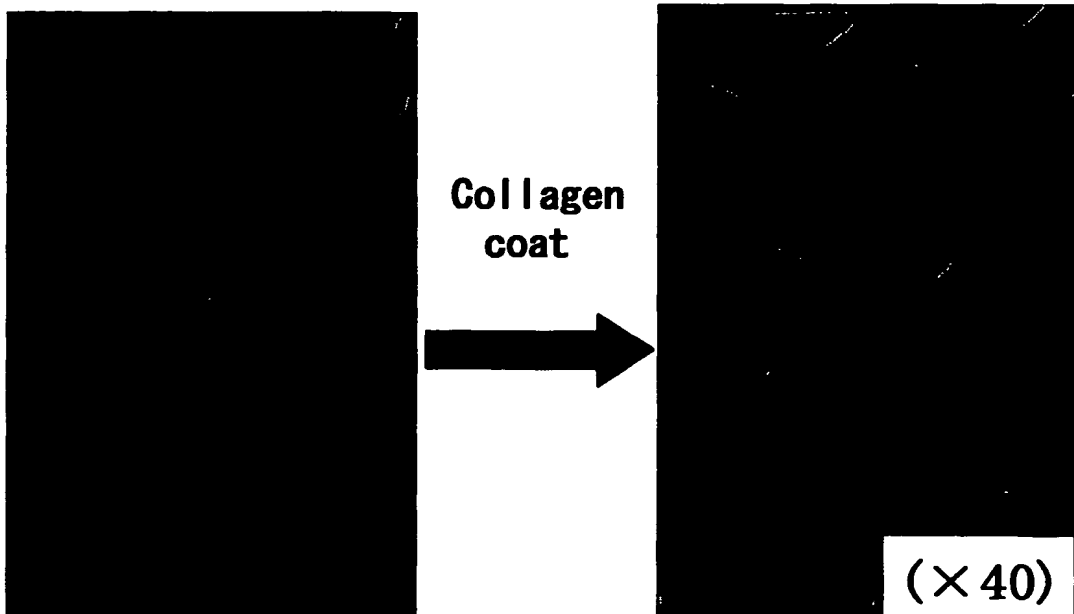
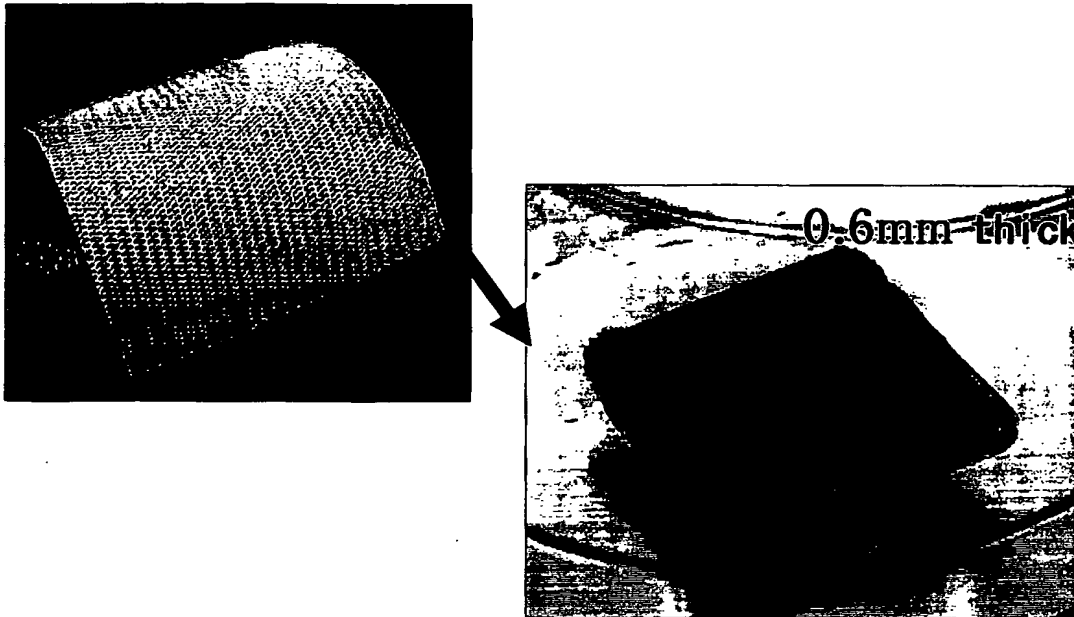
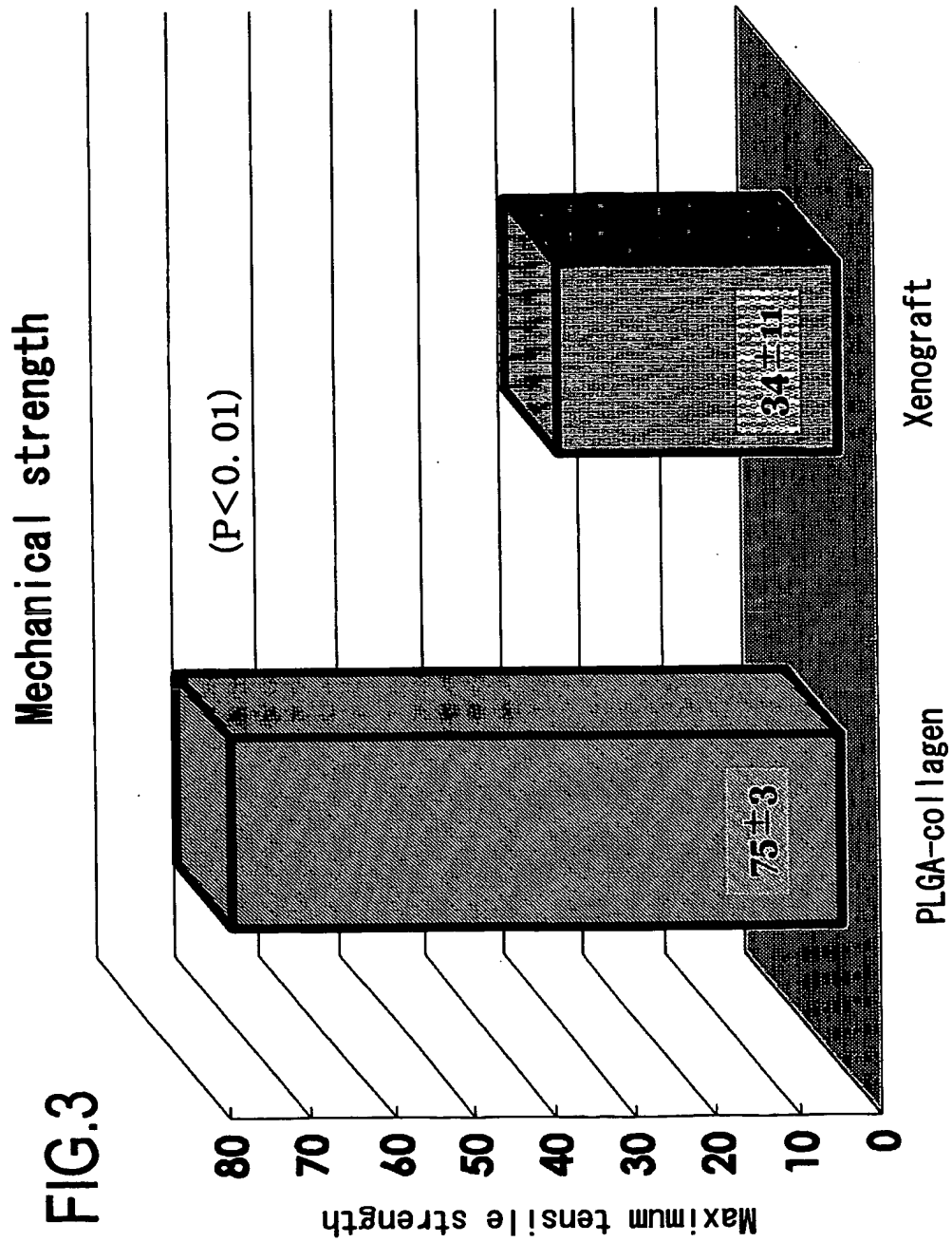


FIG.2



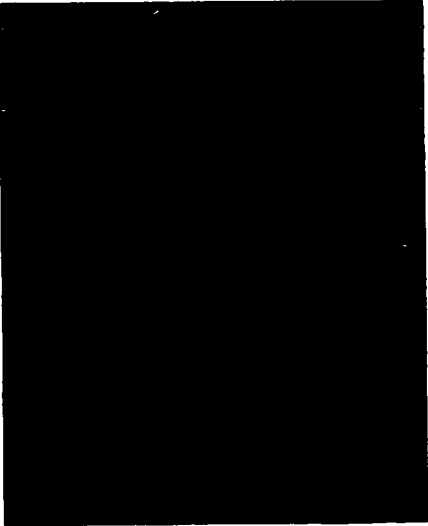


<In vitro: cell adhesion efficiency>

#7 days after cell seeing
Collagen type I+IV

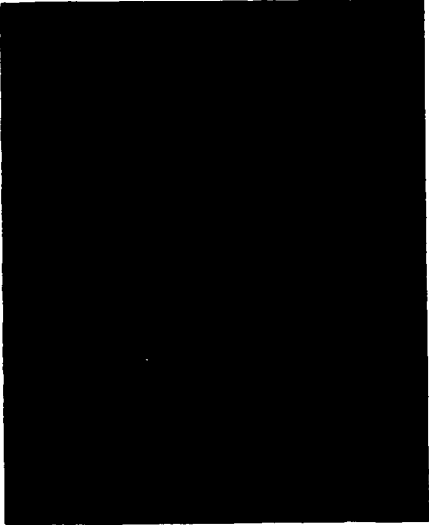
FIG.4

Only collagen type I



(29±10%)

—(P<0.01)—

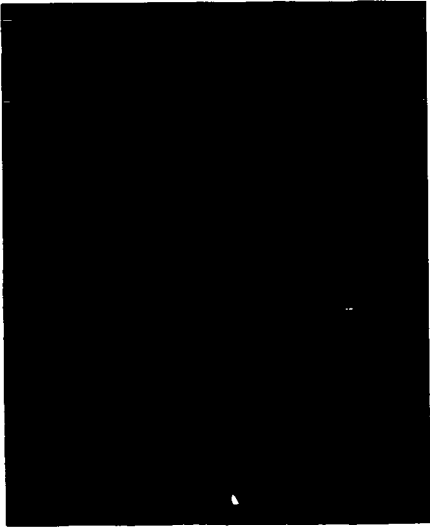


(55±11%)

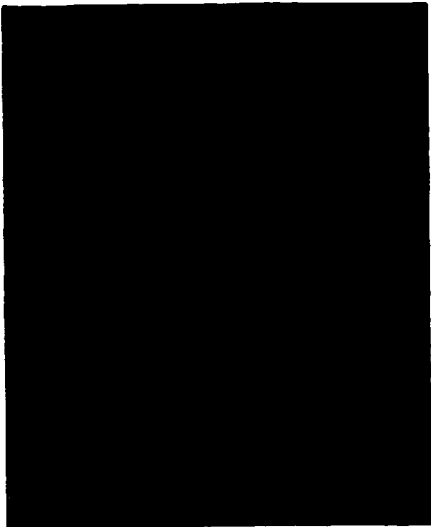
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VECs seeded

—(P<0.01)—



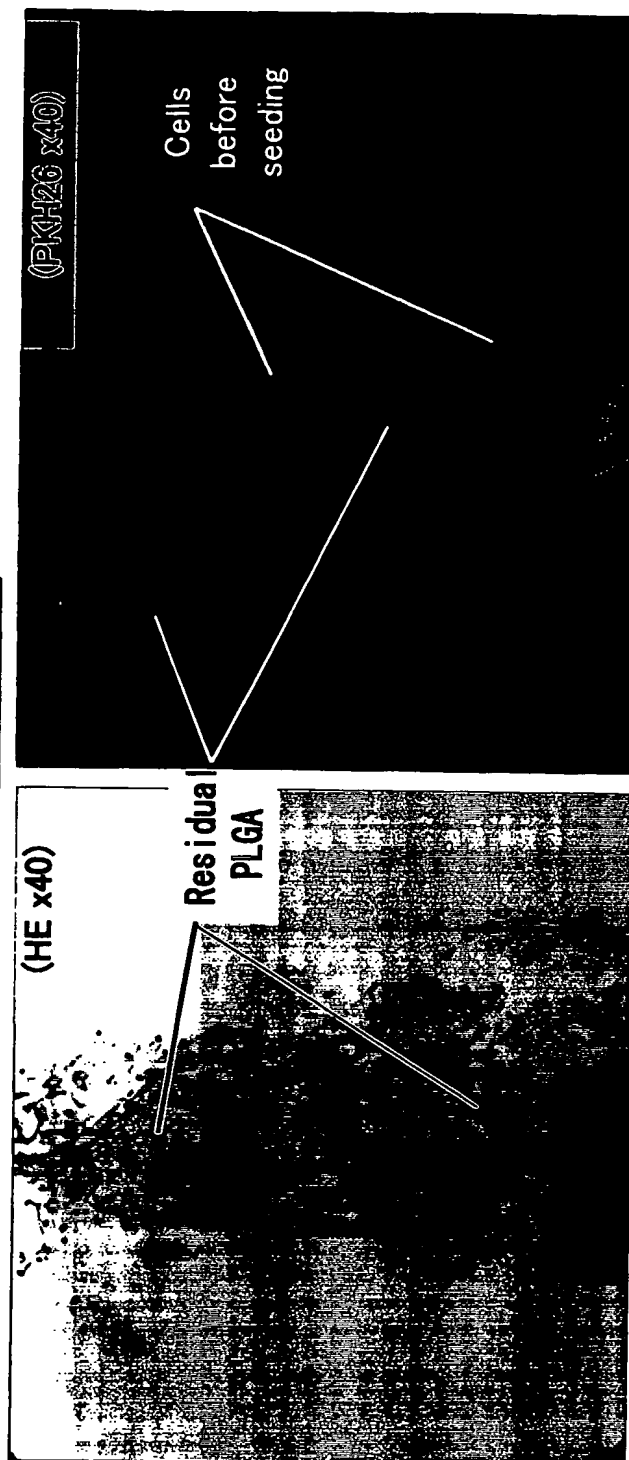
(40±6%)



(69±10%)

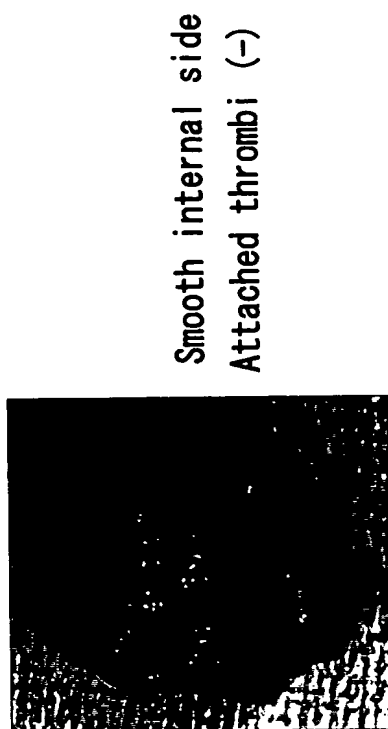
VSMCs seeded

FIG.5 (In vivo: two months after implantation)



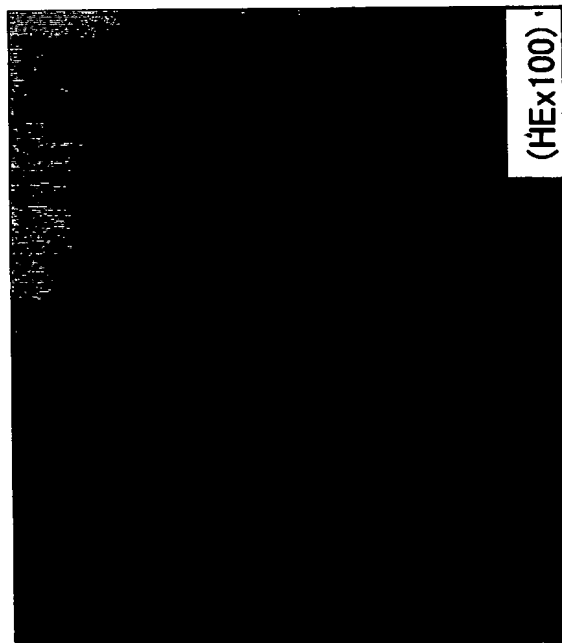
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FIG.6 (In vivo: two months after implantation)

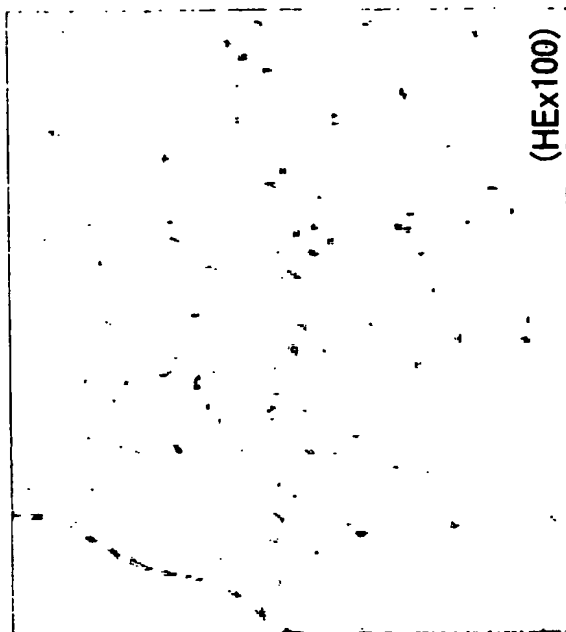


Smooth internal side
Attached thrombi (-)

Cells seeded (+)



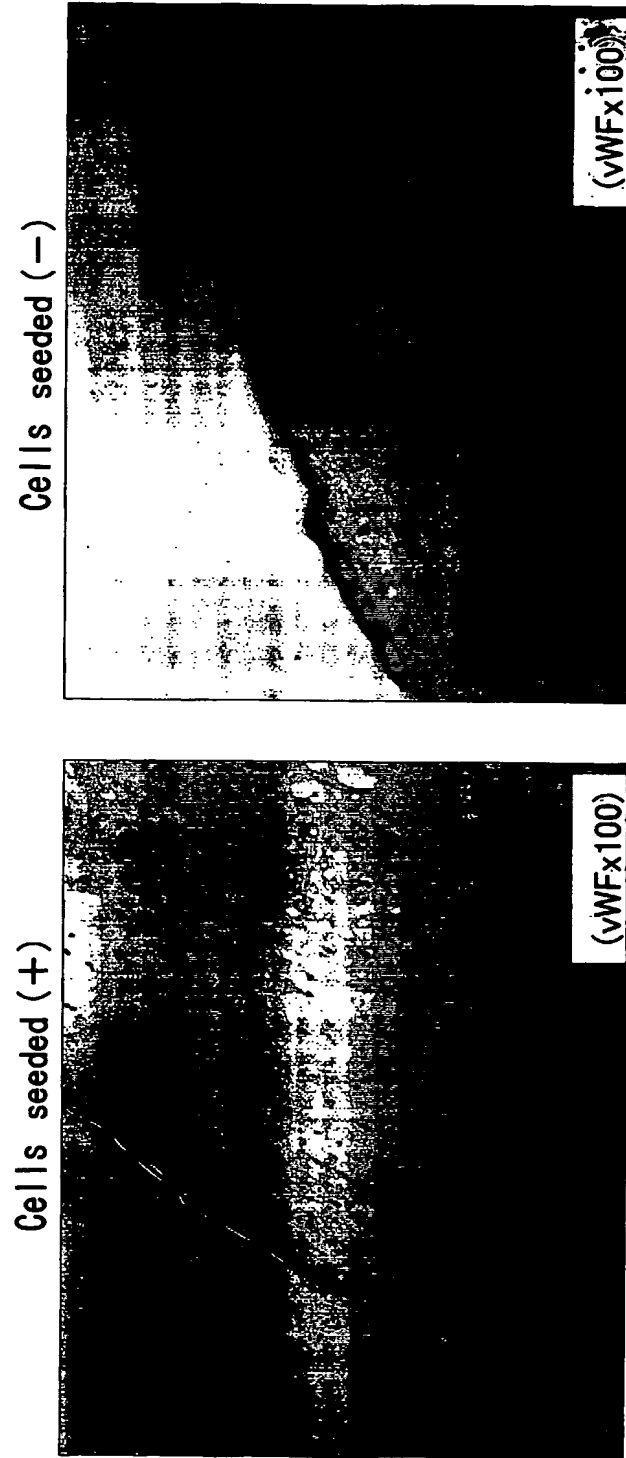
Cells seeded (-)



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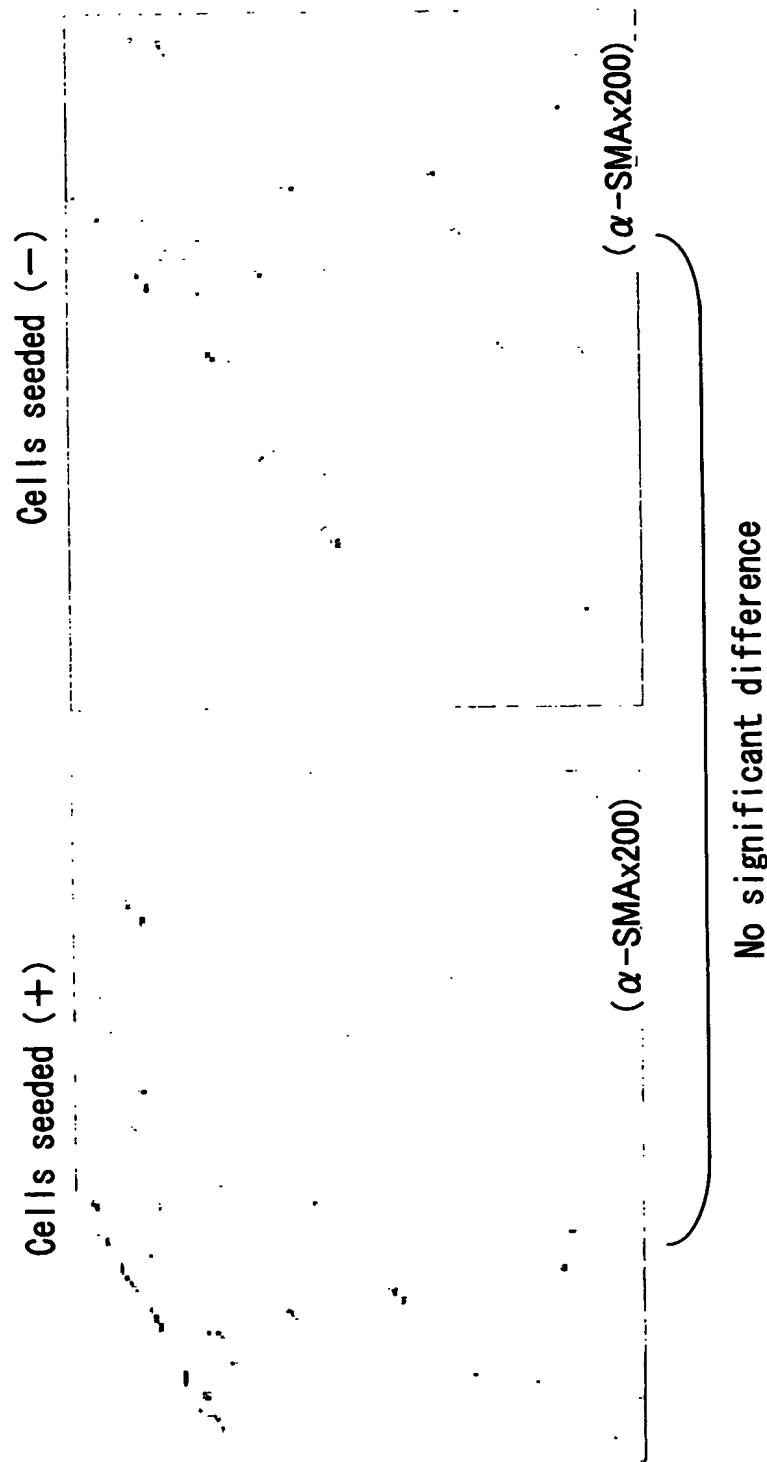
FIG.7

(In vivo: two months after implantation; vascular endothelial cell)



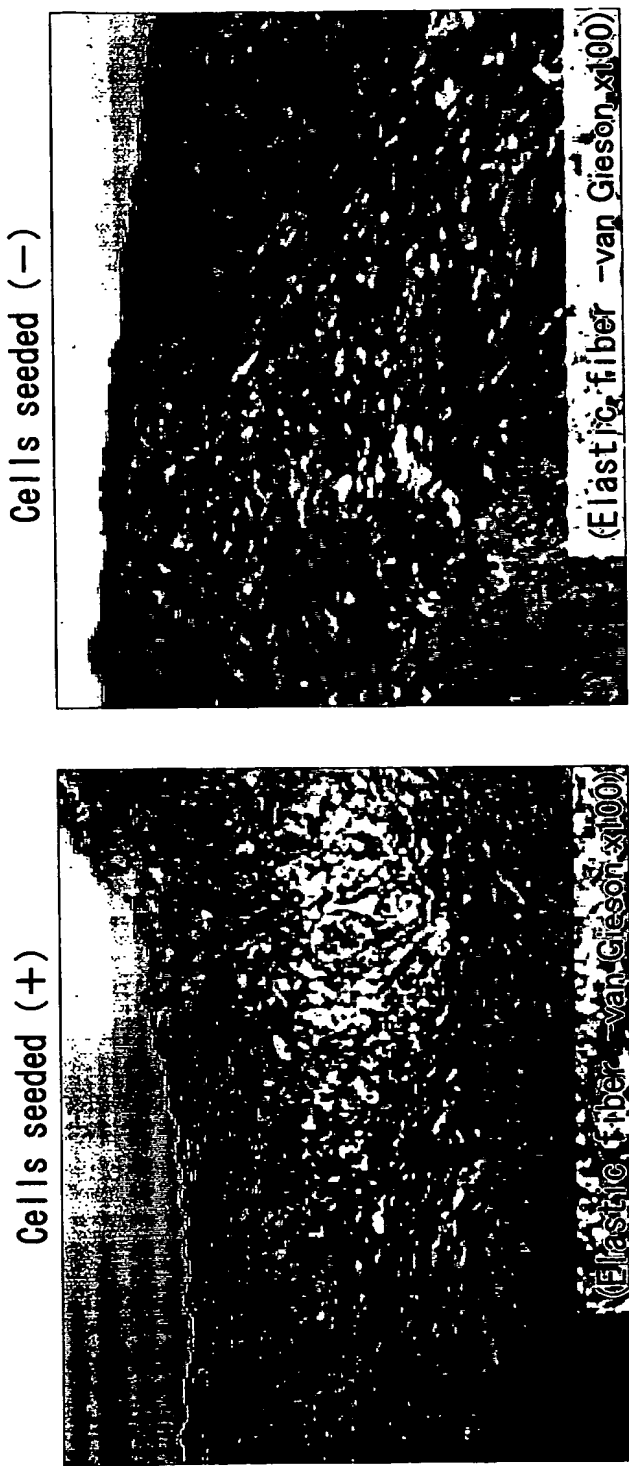
No significant difference

FIG.8
(In vivo: two months after implantation; vascular smooth muscle cell)



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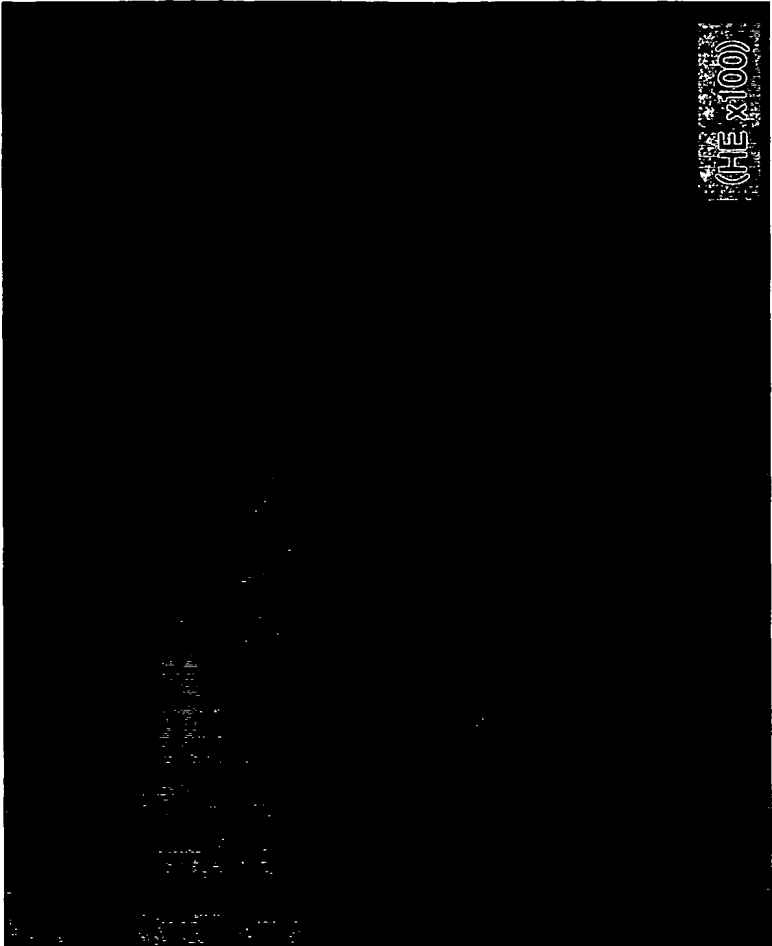
FIG.9
(In vivo: two months after implantation: elastic fiber)



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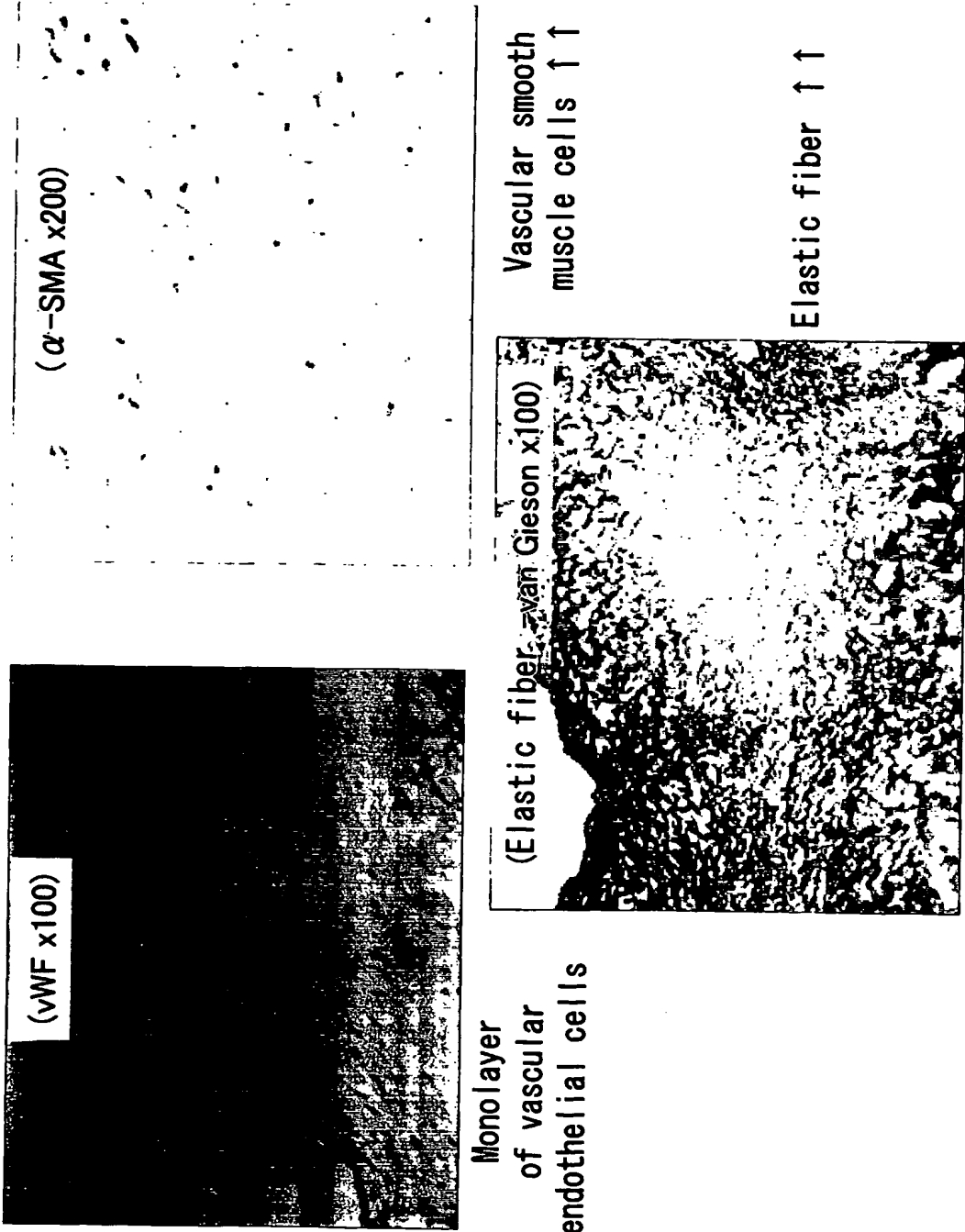
FIG.10 (In vivo: six months after implantation)

Cells seeded (—)



Smooth internal side
Attached thrombi (—)

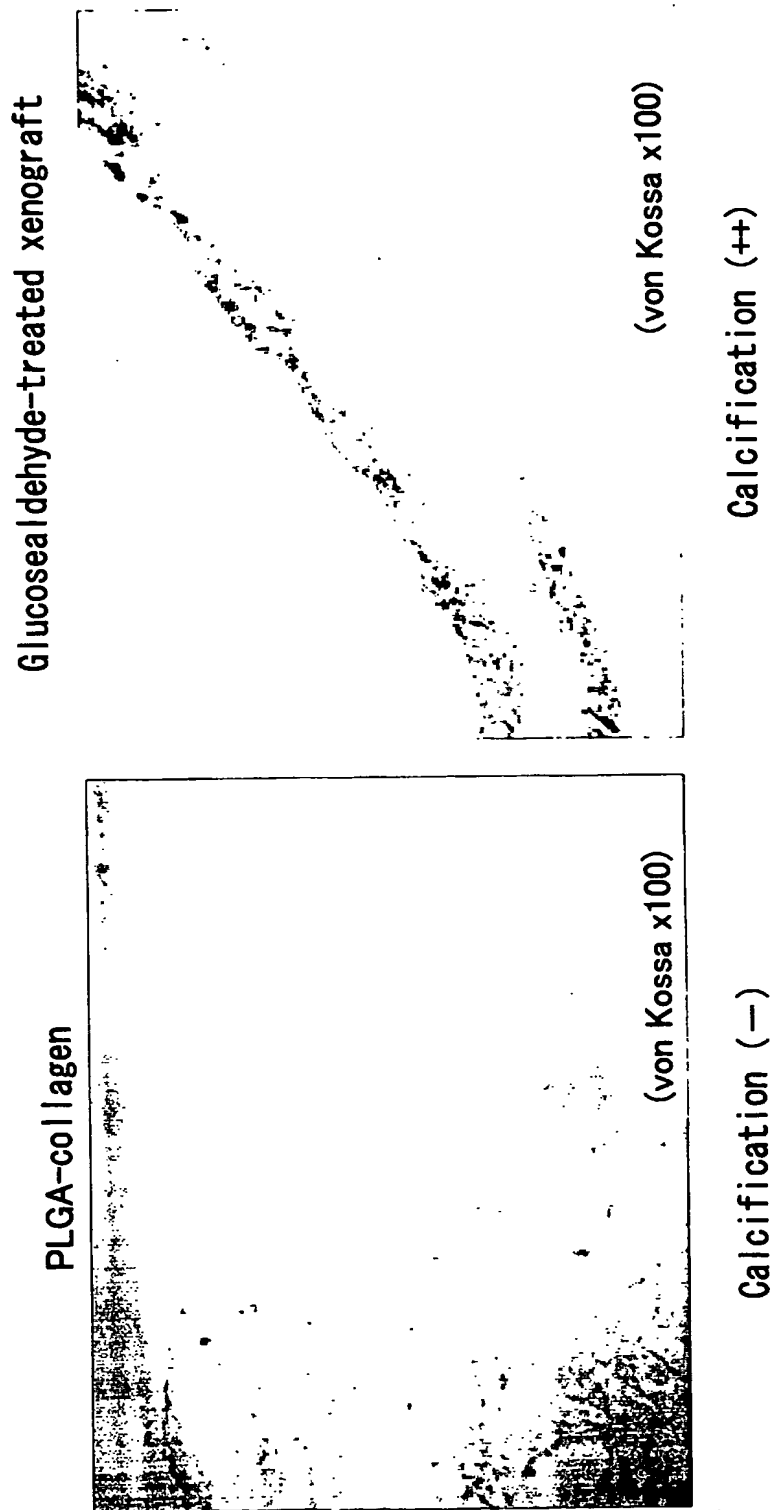
FIG.11 (In vivo: six months after implantation)



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FIG.12

(In vivo: six months after implantation; calcification)



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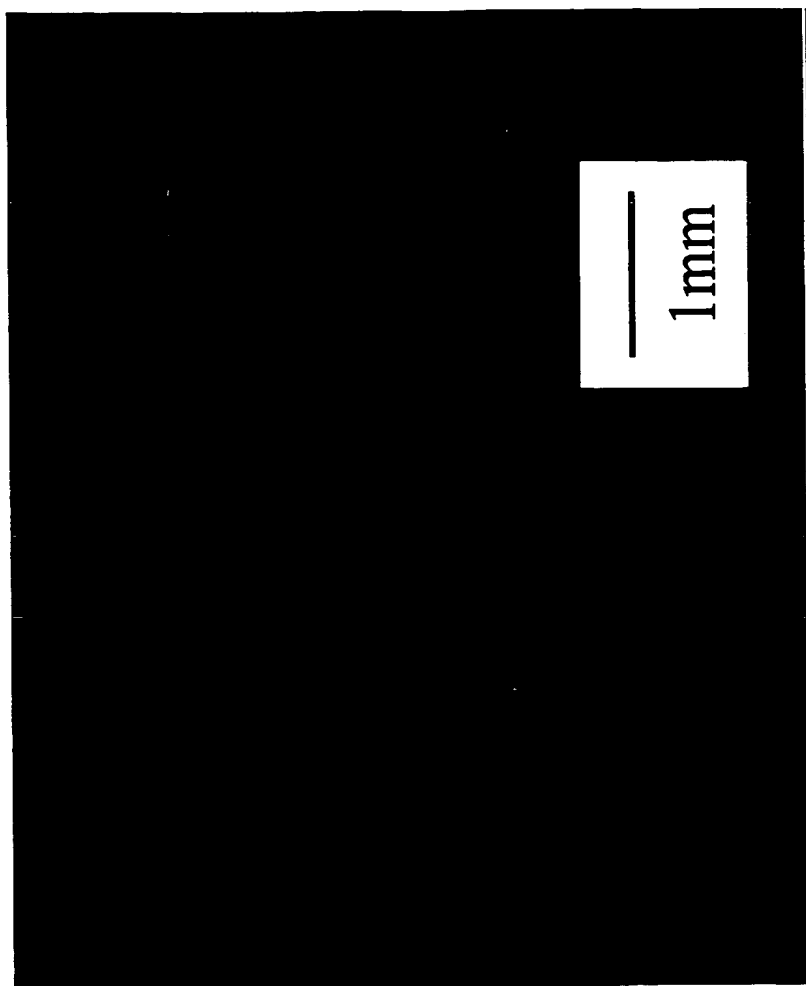


FIG.13A

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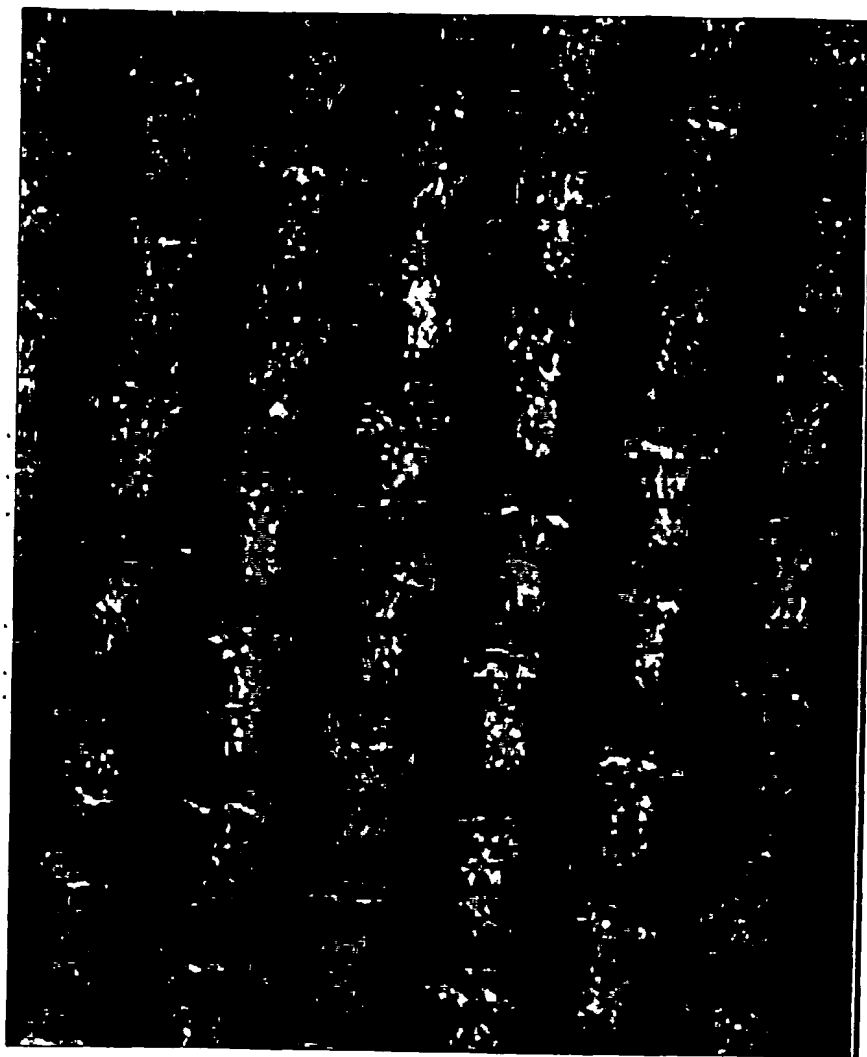


FIG.13B

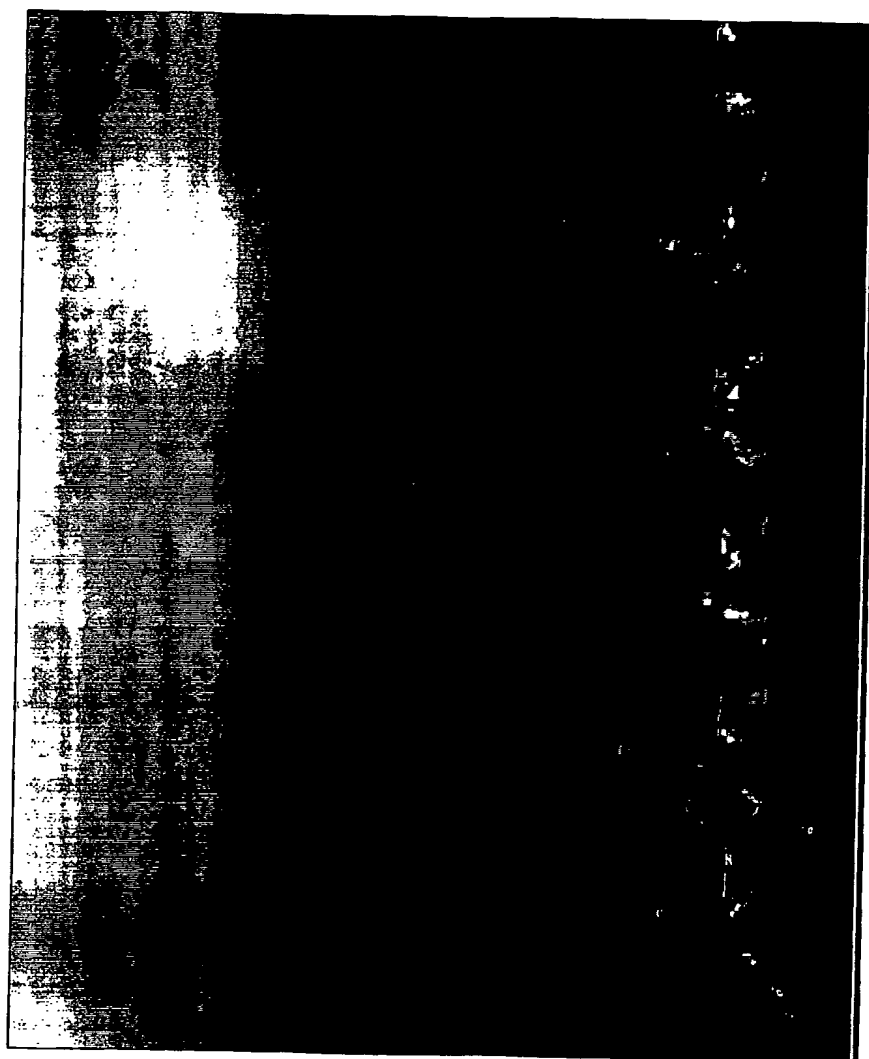


FIG.14

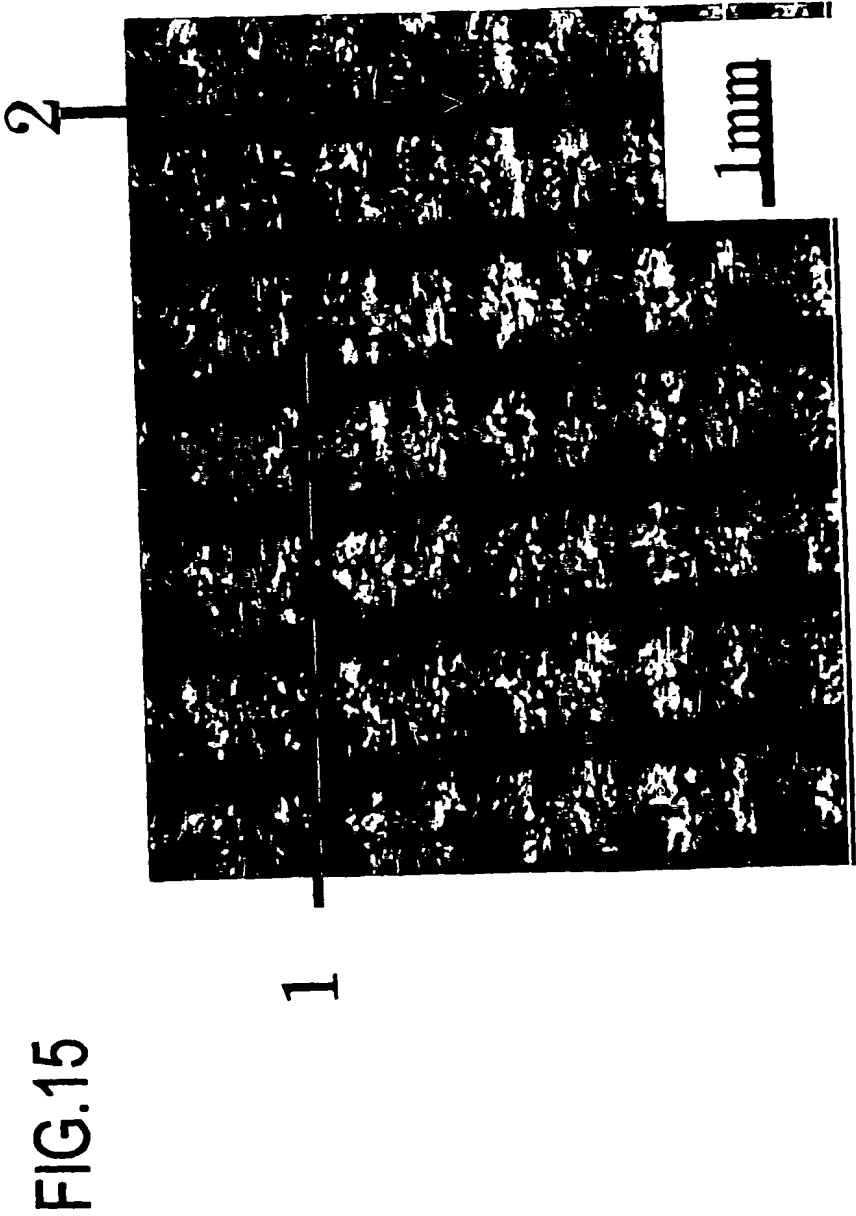
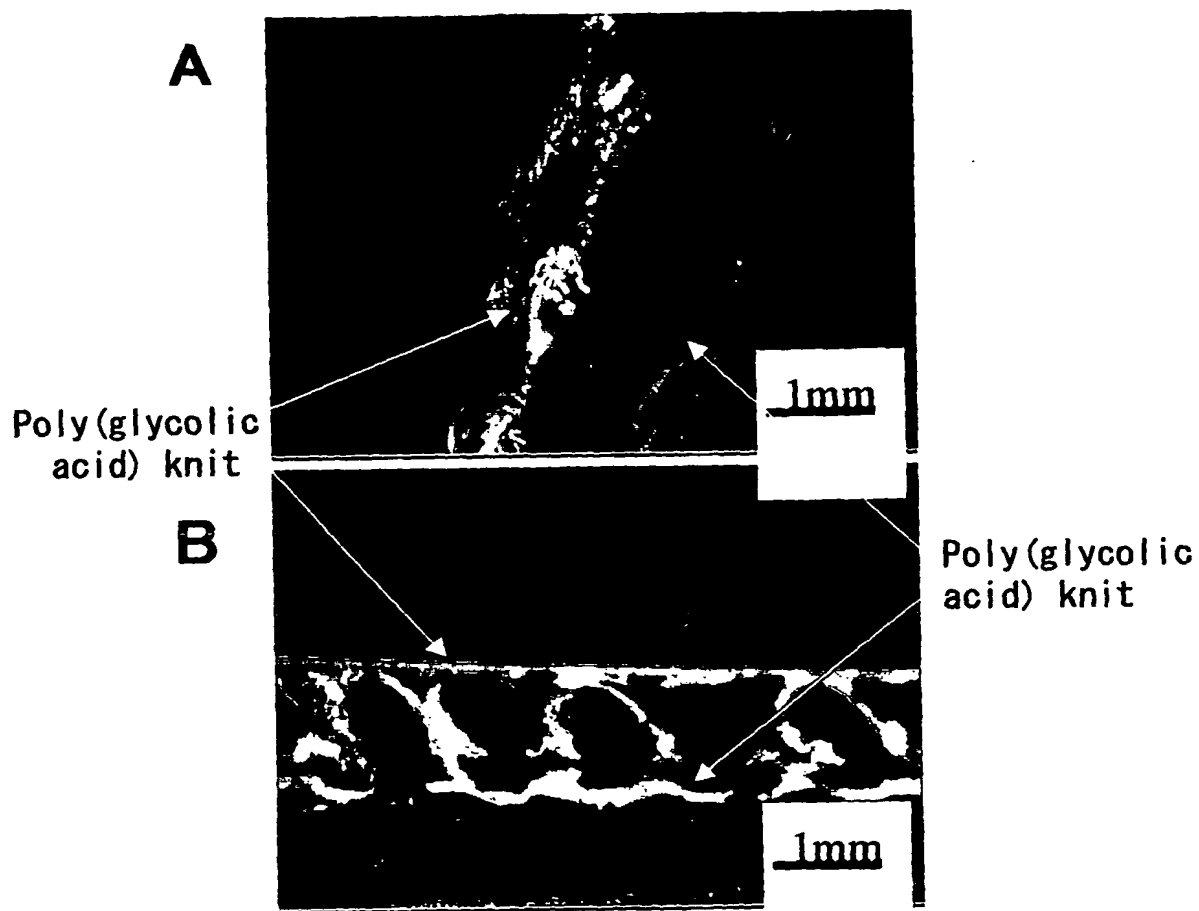


FIG.16A



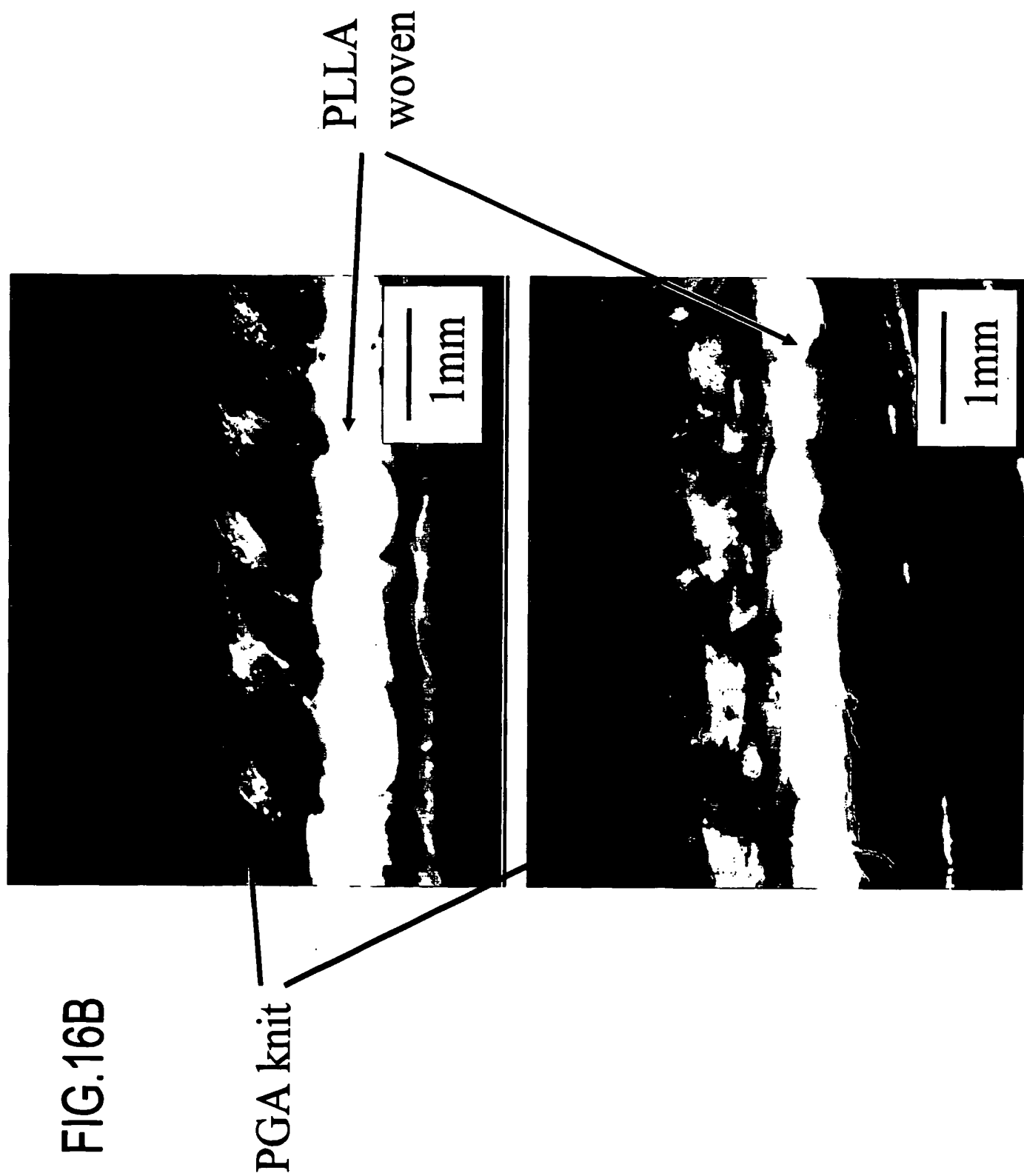


FIG.17

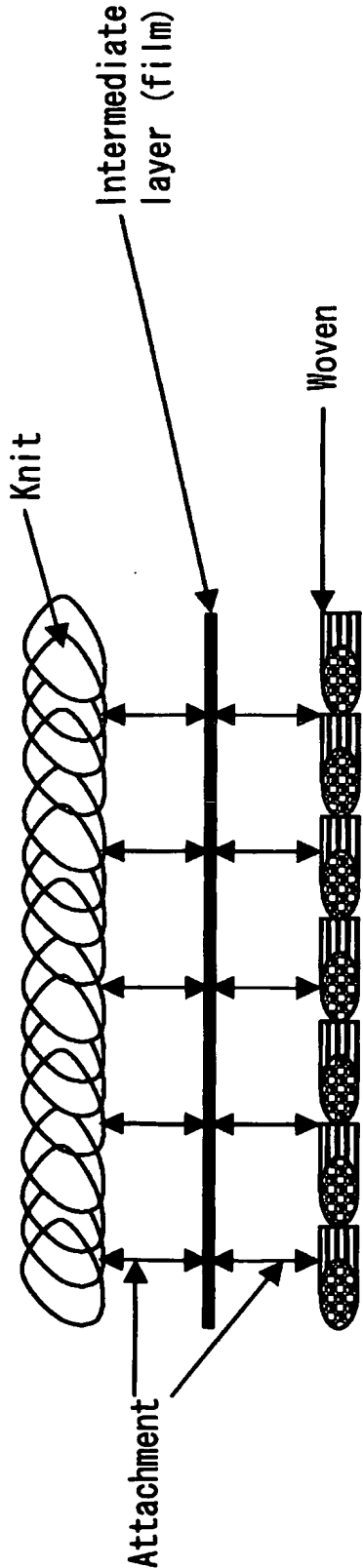
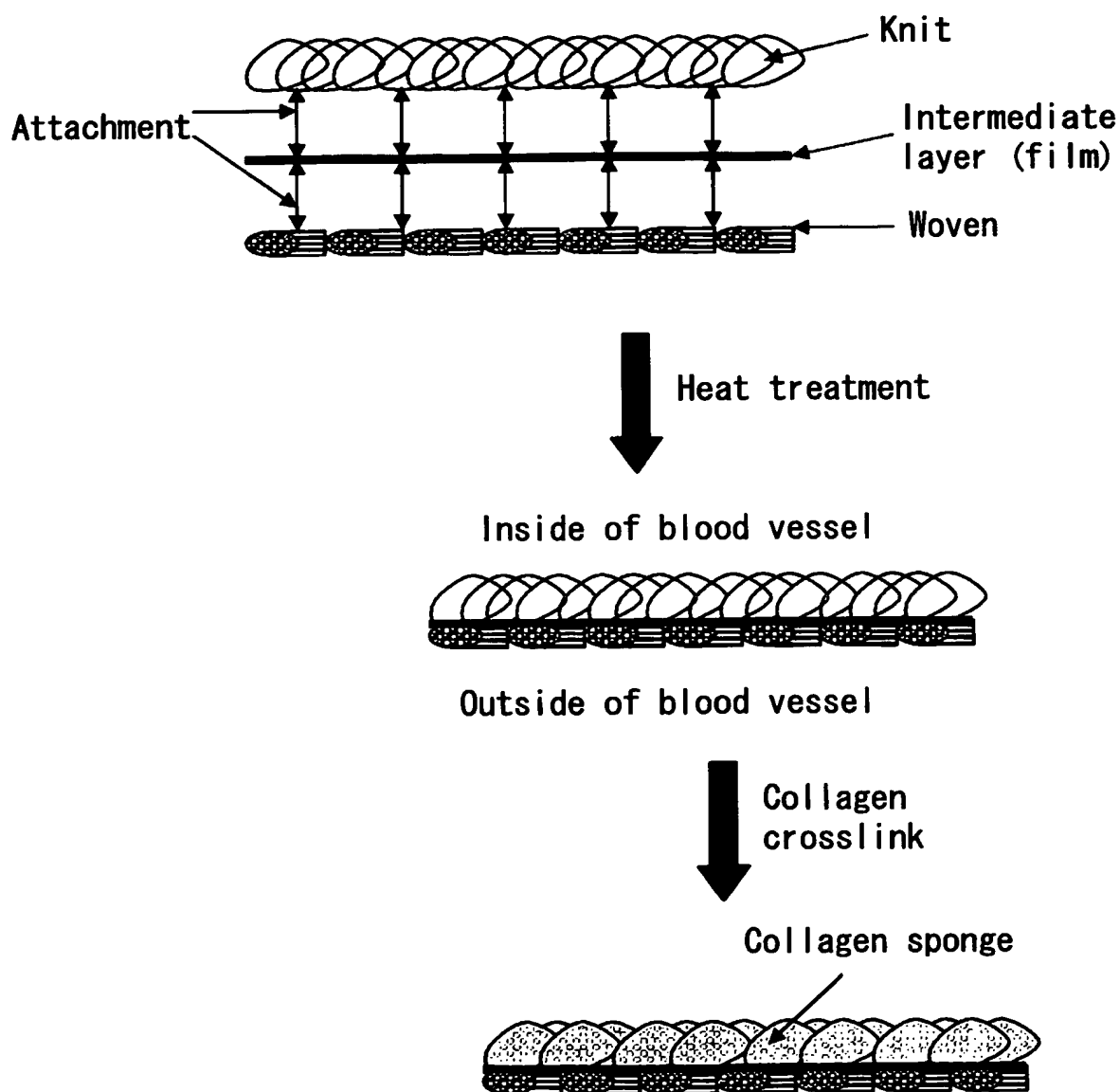
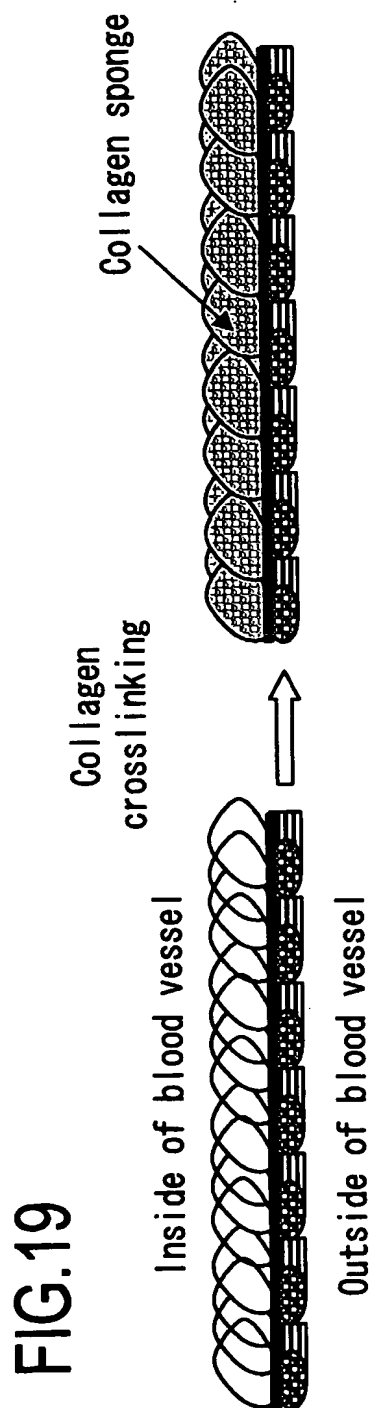


FIG.18 Patch production method





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FIG.20A

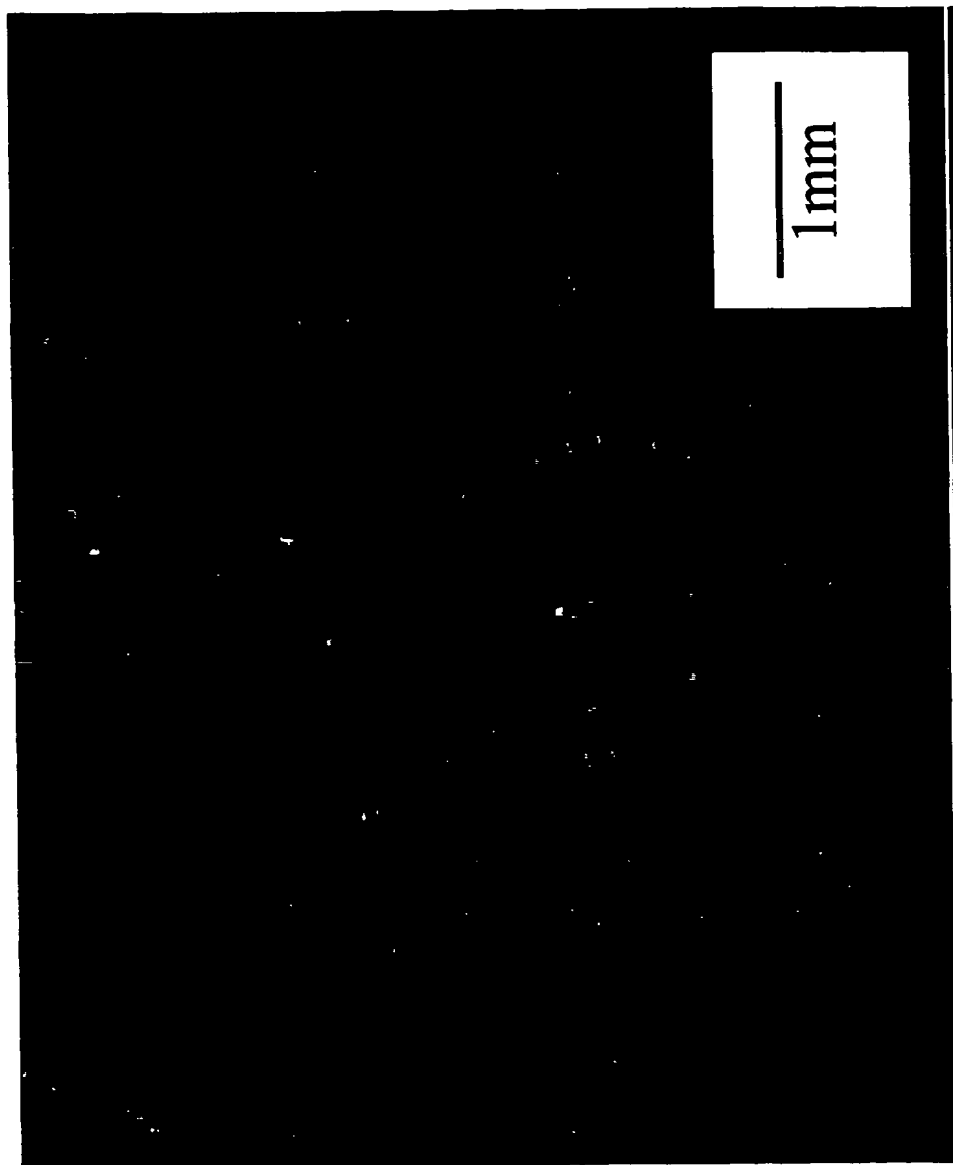
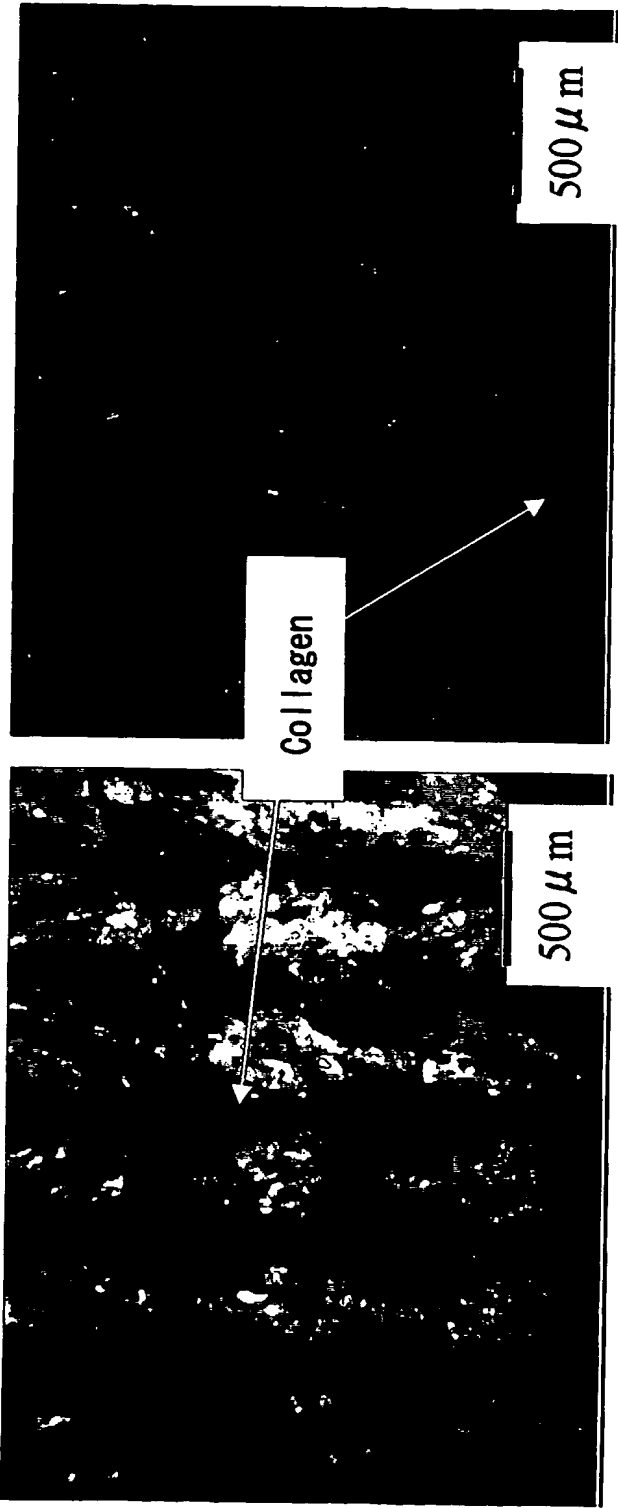


FIG.20B

Collagen crosslinking



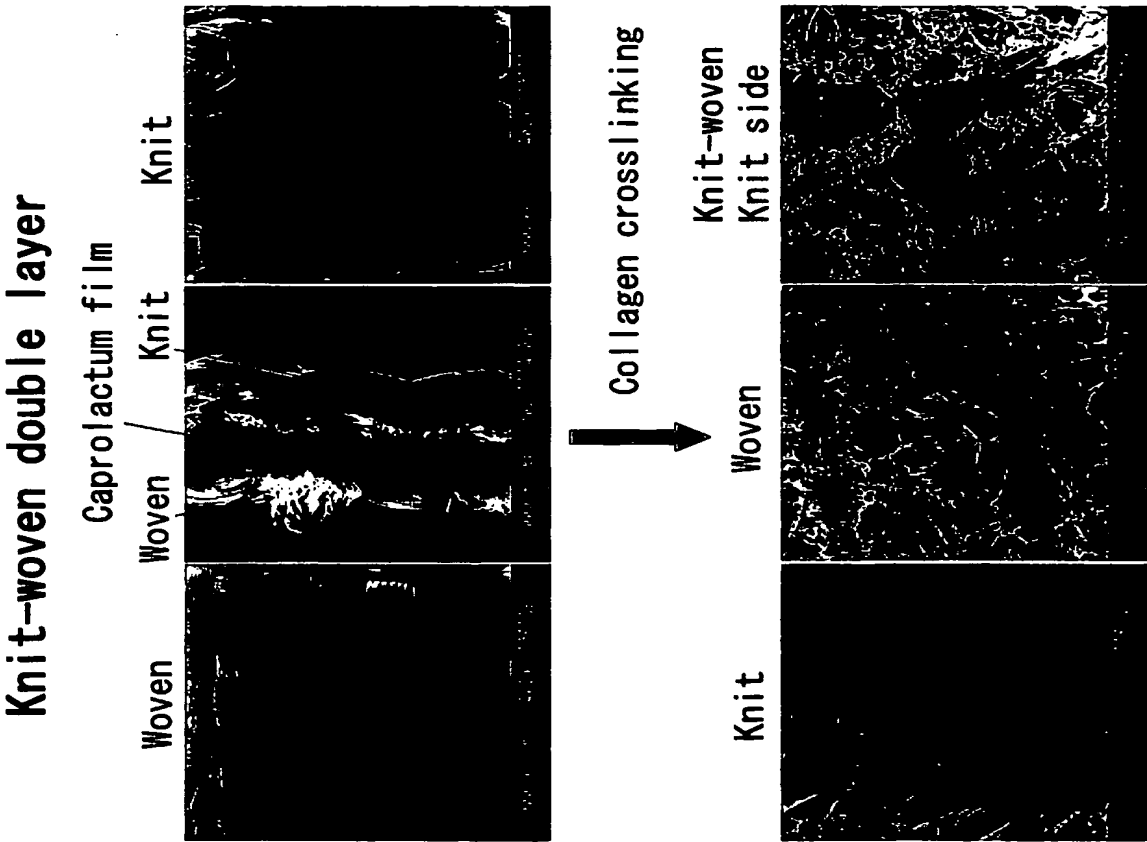
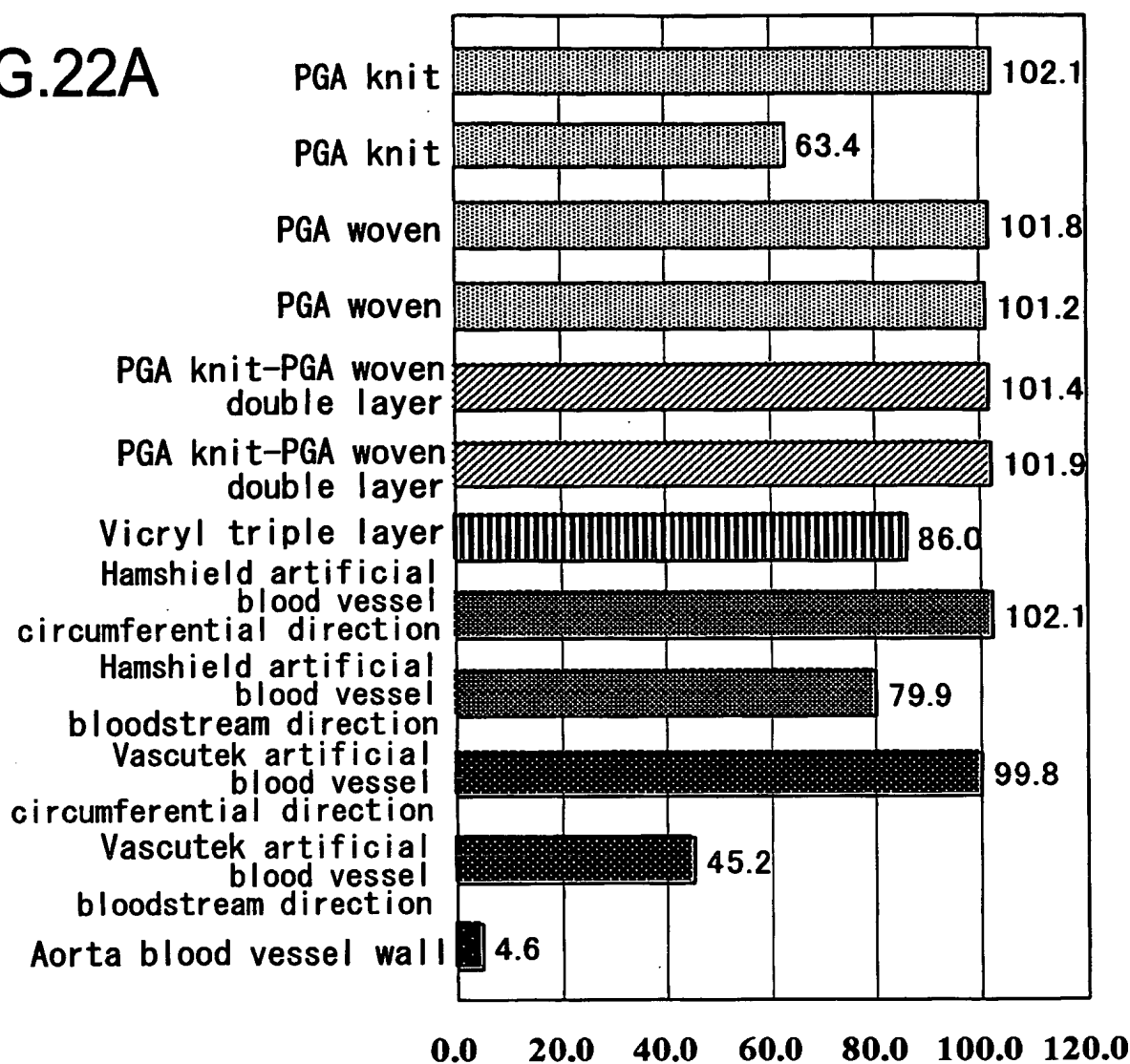


FIG.21

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FIG.22A



	Tensile strength
Aorta blood vessel wall	4.6
Vascutek artificial blood vessel bloodstream direction	45.2
Vascutek artificial blood vessel circumferential direction	99.8
Hamshield artificial blood vessel bloodstream direction	79.9
Hamshield artificial blood vessel circumferential direction	102.1
Vicryl triple layer	86.0
PGA knit-PGA woven double layer	101.9
PGA knit-PGA woven double layer	101.4
PGA woven	101.2
PGA woven	101.8
PGA knit	63.4
PGA knit	102.1

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Tension test: poly(L-lactic acid)

	Tensile strength, N
Aorta blood vessel wall	4.6
Vascutek artificial blood vessel bloodstream direction	45.2
Vascutek artificial blood vessel circumferential direction	99.8
Hamshield artificial blood vessel bloodstream direction	79.9
Hamshield artificial blood vessel circumferential direction	102.1
PGA knit No3 warp	73.8
PGA knit No3 weft	61.2
PLA woven 47.5 warp	43.7
PLA woven 47.5 weft	82.5
PGA knit No3-PLA woven warp	56.5
PGA knit No3-PLA woven weft	98.8

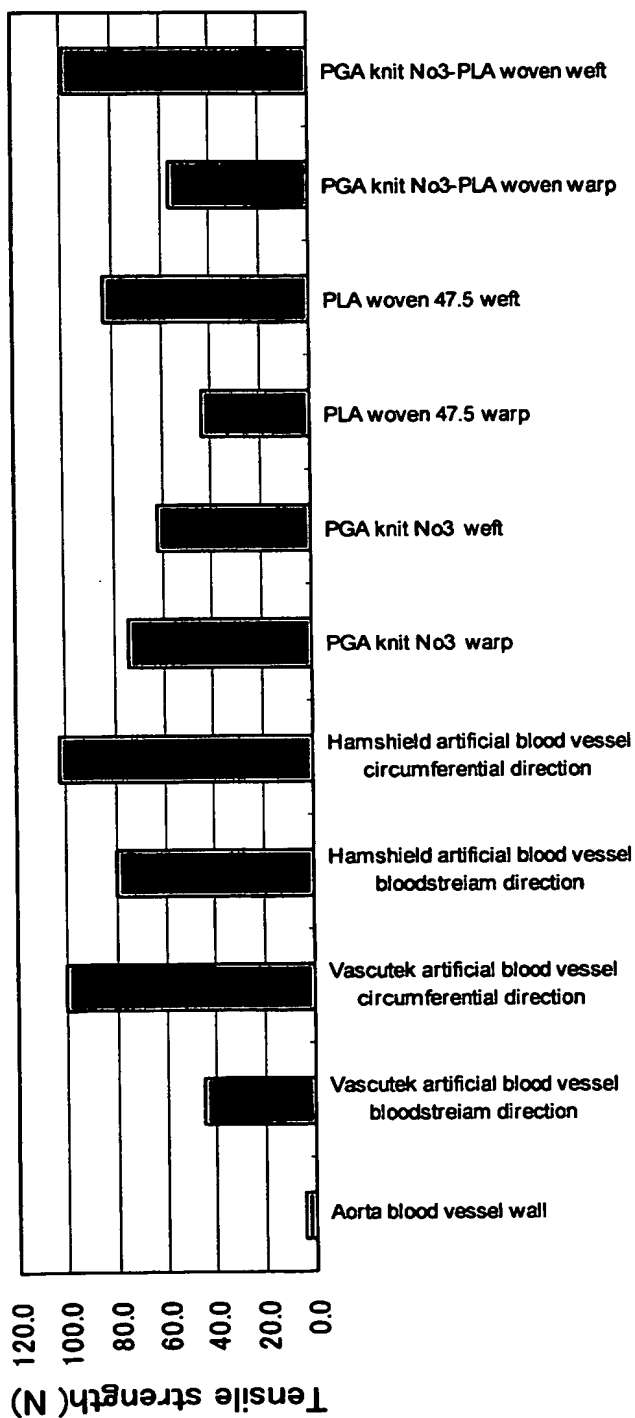
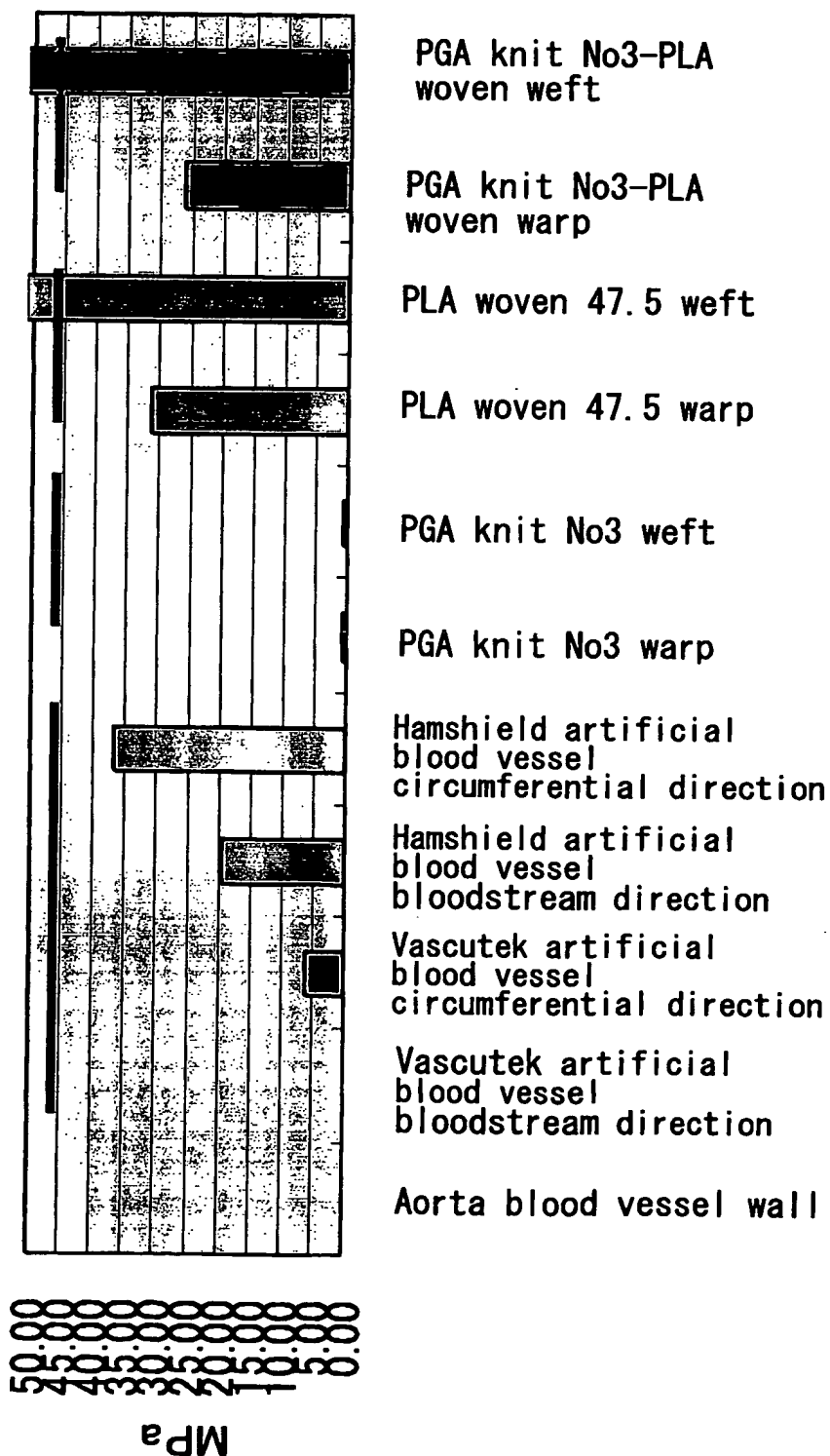


FIG.22B

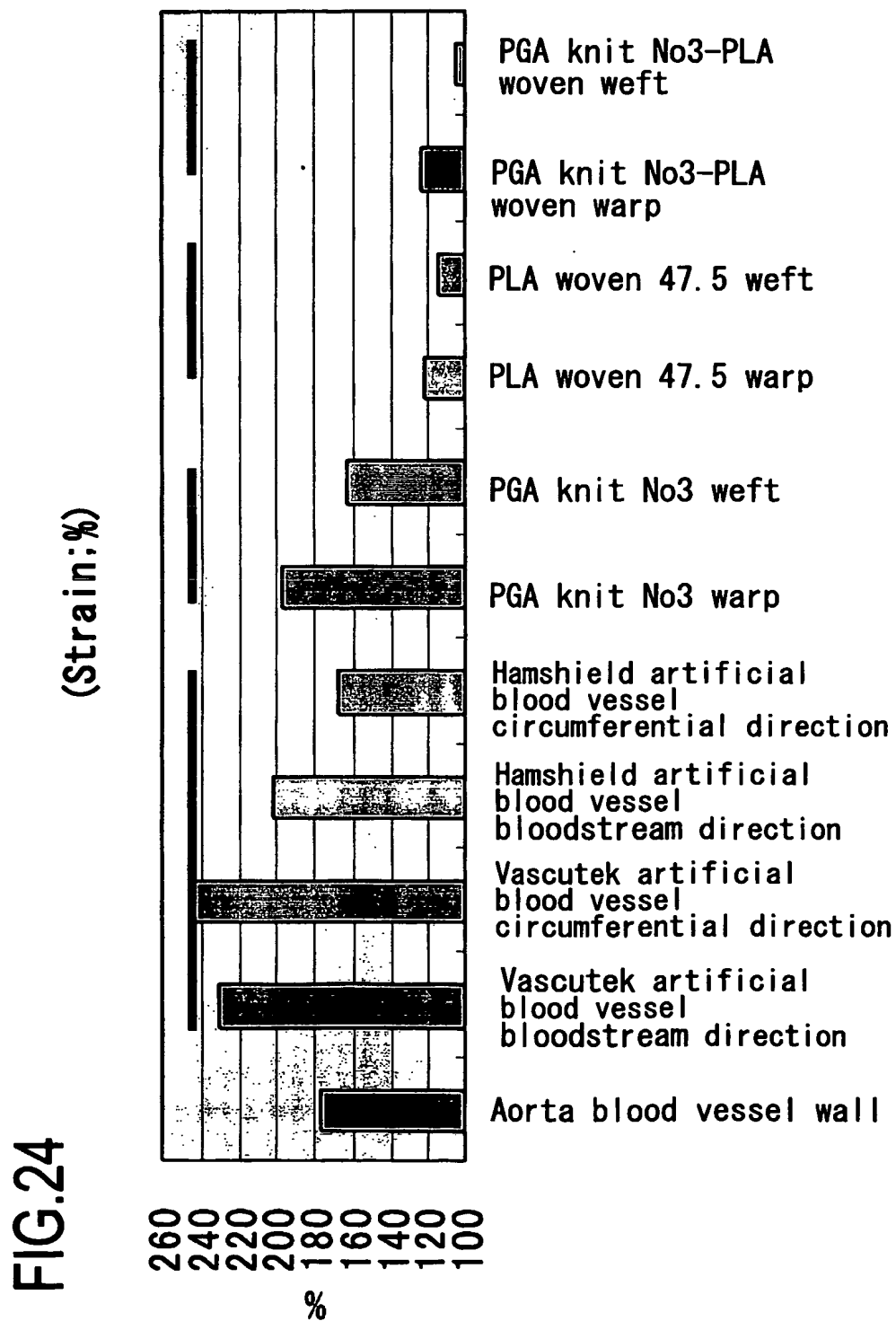
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FIG.23

Young's modulus; Mpa

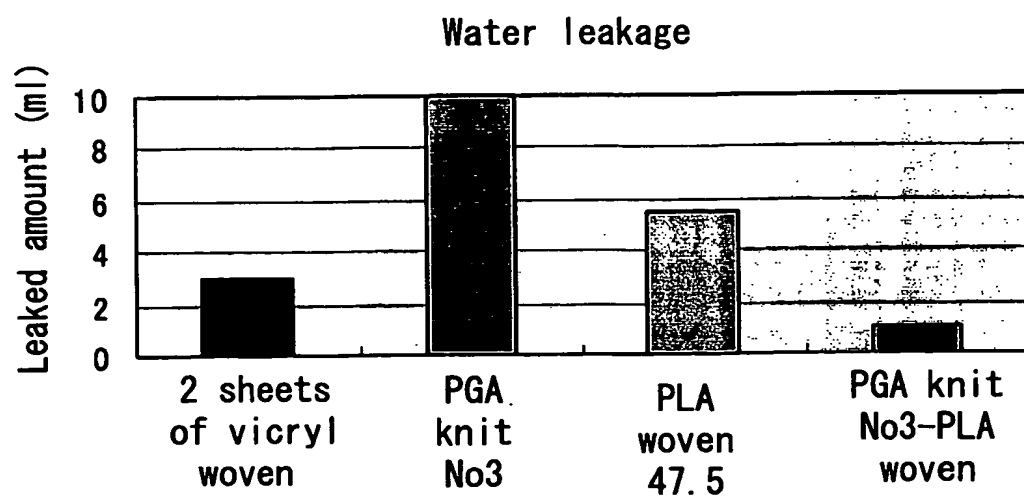
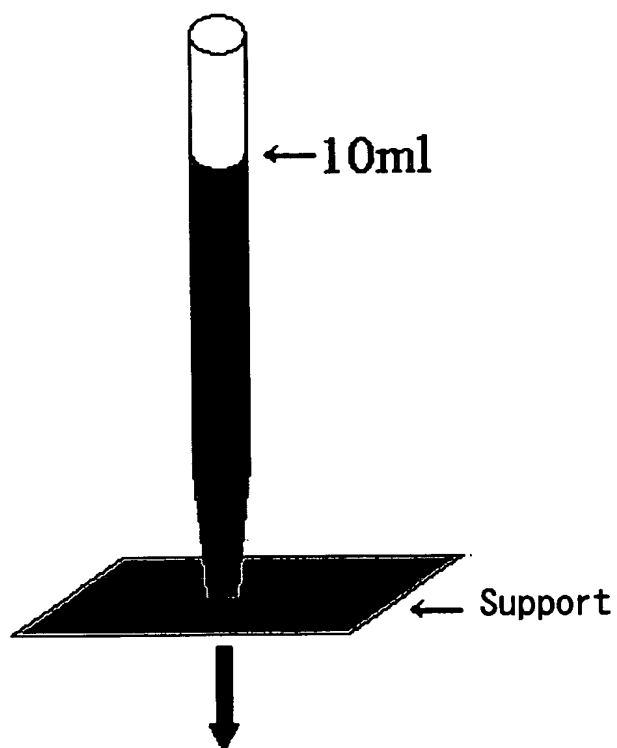


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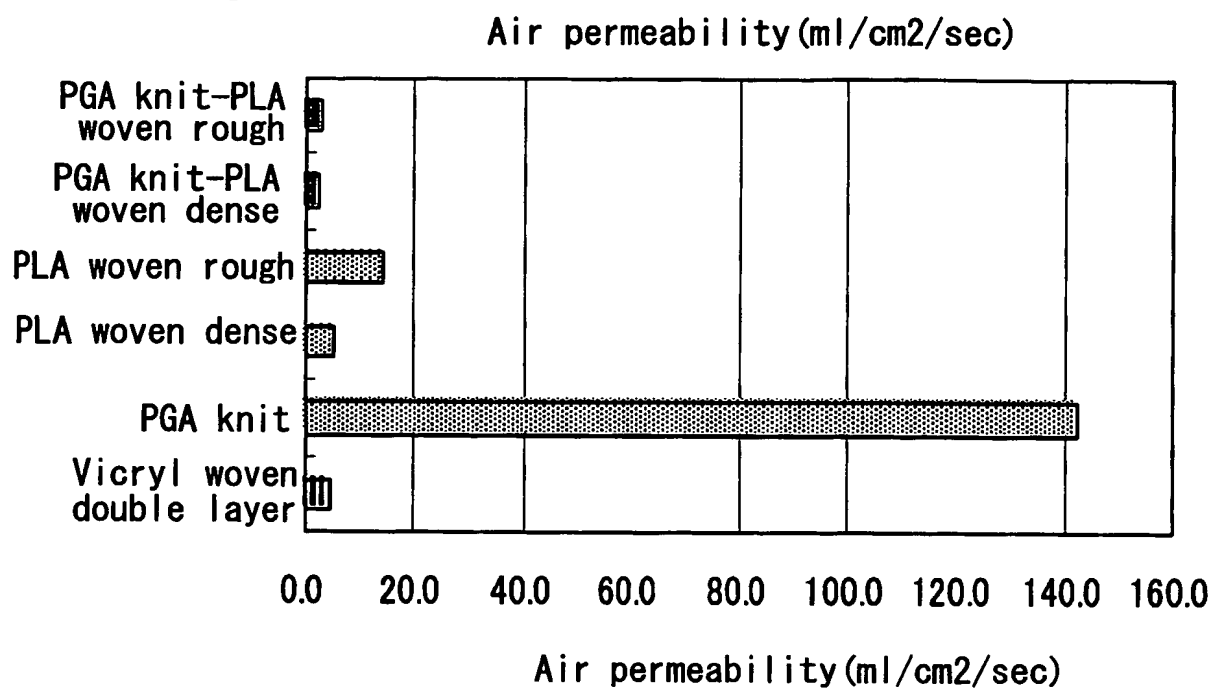
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FIG.25



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FIG.26

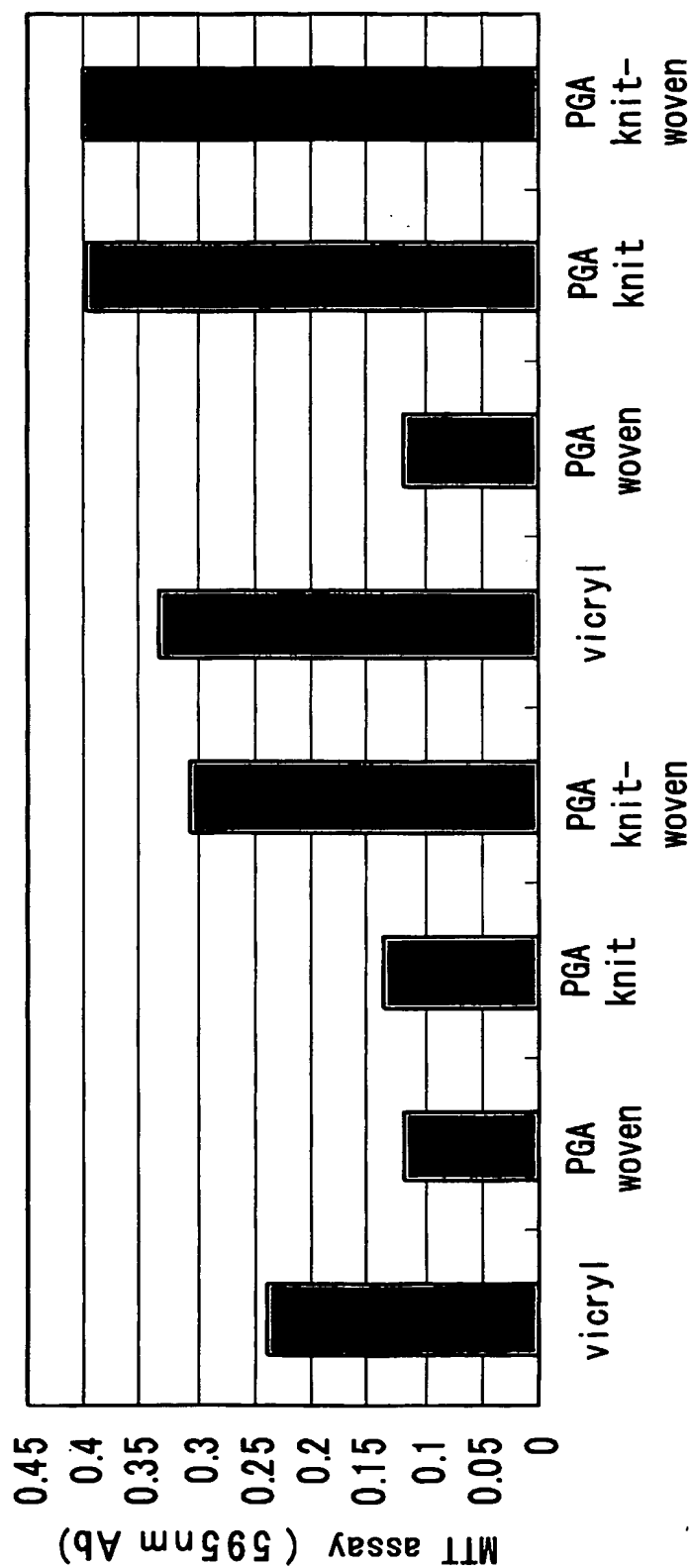


Air permeability test	Air permeability(ml/cm ² /sec)
Vicryl woven double layer	4.3
PGA knit	142.3
PLA woven dense	5.1
PLA woven rough	14.1
PGA knit-PLA woven dense	2.1
PGA knit-PLA woven rough	2.6

FIG.27A

After 15 hours

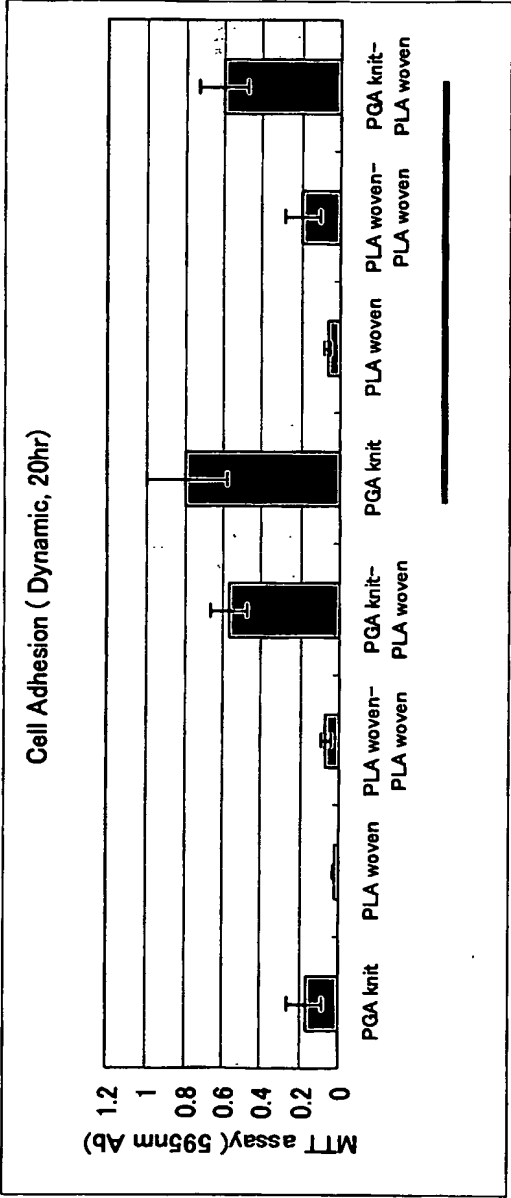
Number of cell adhesions



After collagen crosslink

FIG.27B

Cell adhesion test

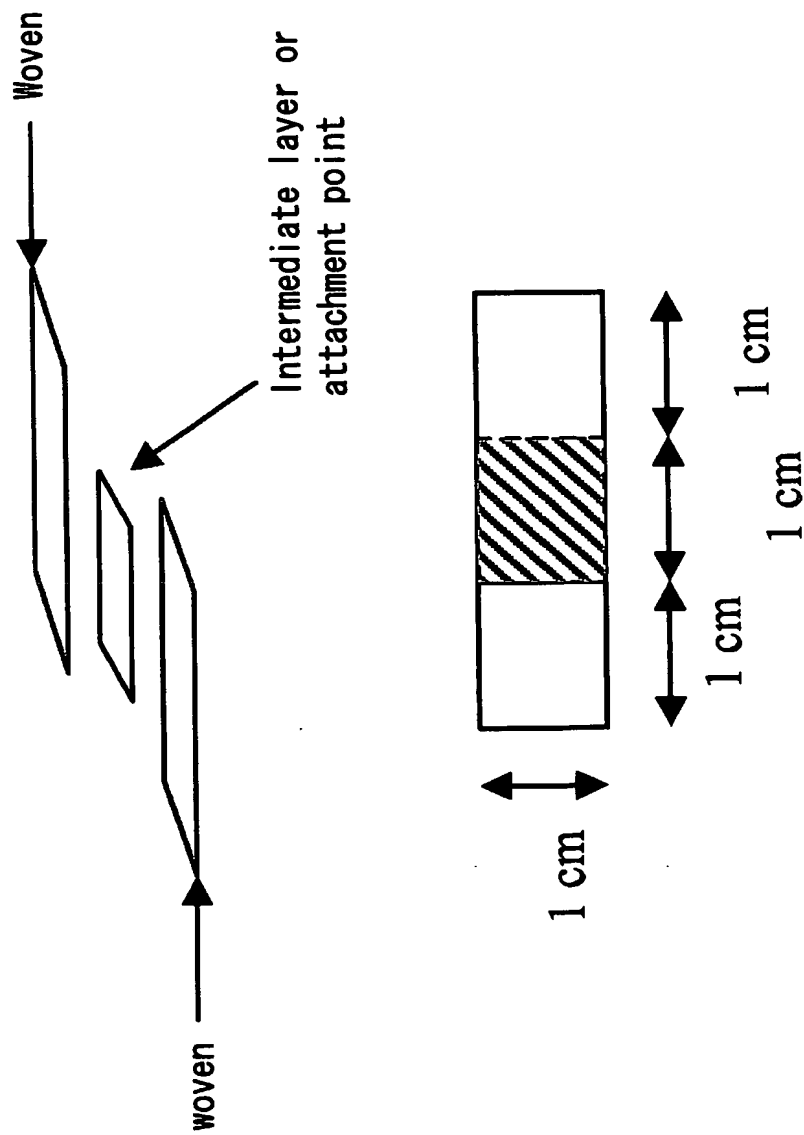


After collagen crosslinking

	Mean	S.D.
PGA knit	0.174	0.091
PLA woven	0.024	0.008
PLA woven-PLA woven	0.071	0.028
PGA knit-PLA woven	0.572	0.092
PGA knit	0.792	0.205
PLA woven	0.068	0.016
PLA woven-PLA woven	0.198	0.094
PGA knit-PLA woven	0.606	0.123

After collagen crosslinking

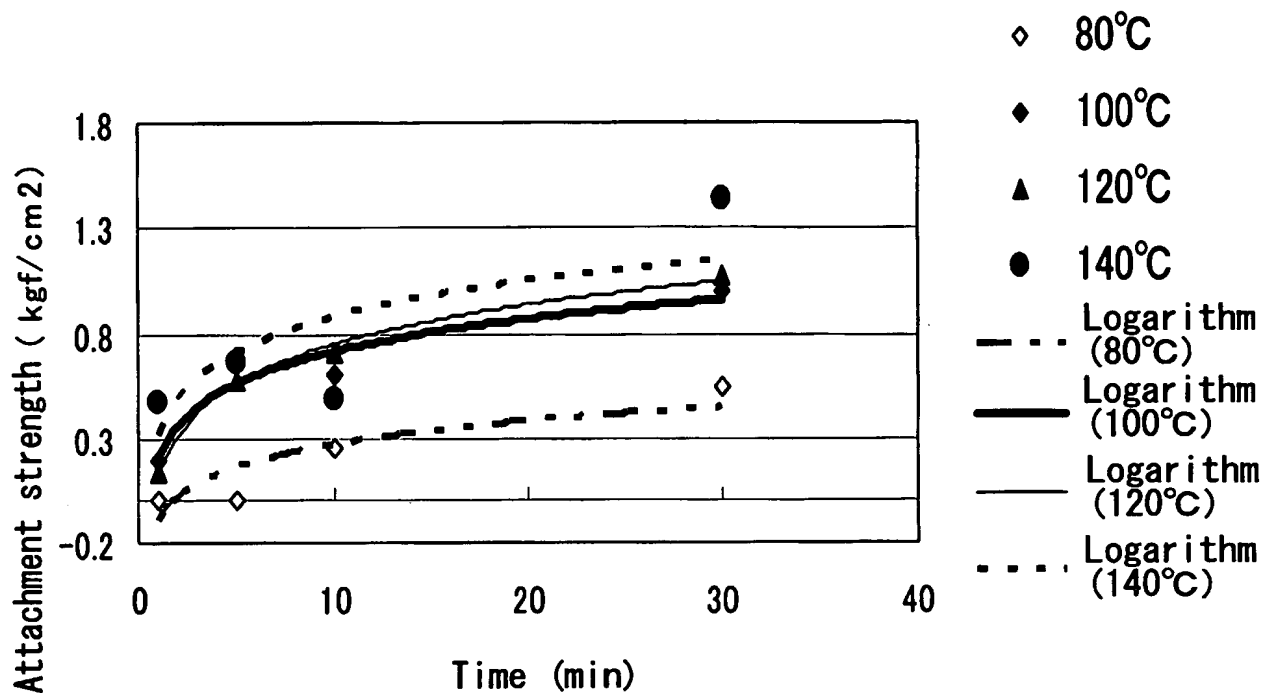
FIG.28



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FIG.29A

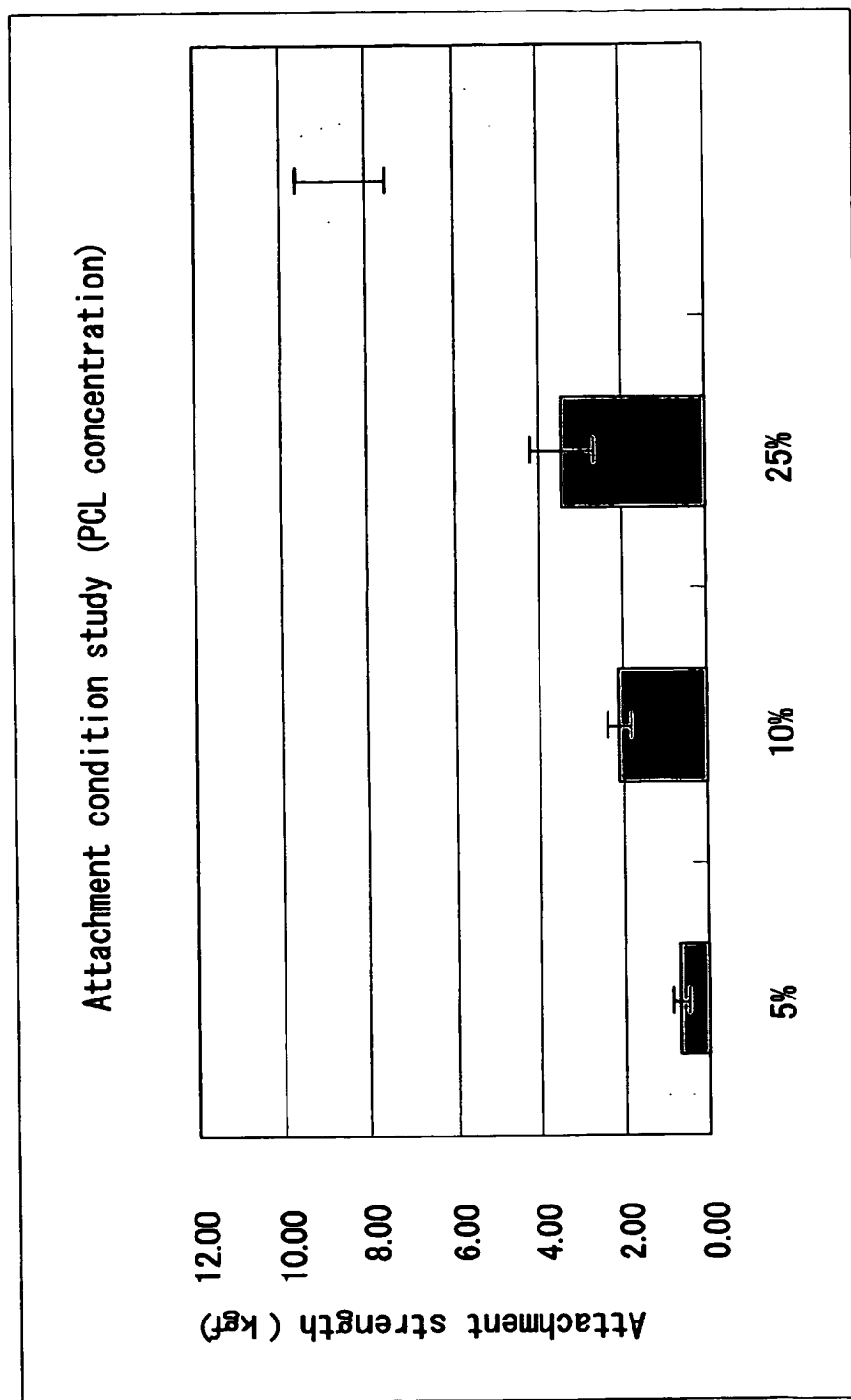
Attachment strength Study on conditions



	80°C	100°C	120°C	140°C
1	0	0.1945	0.1363	0.4682
5	0	0.6553	0.5782	0.6634
10	0.257	0.6029	0.7035	0.4879
30	0.5395	0.9898	1.0695	1.4402

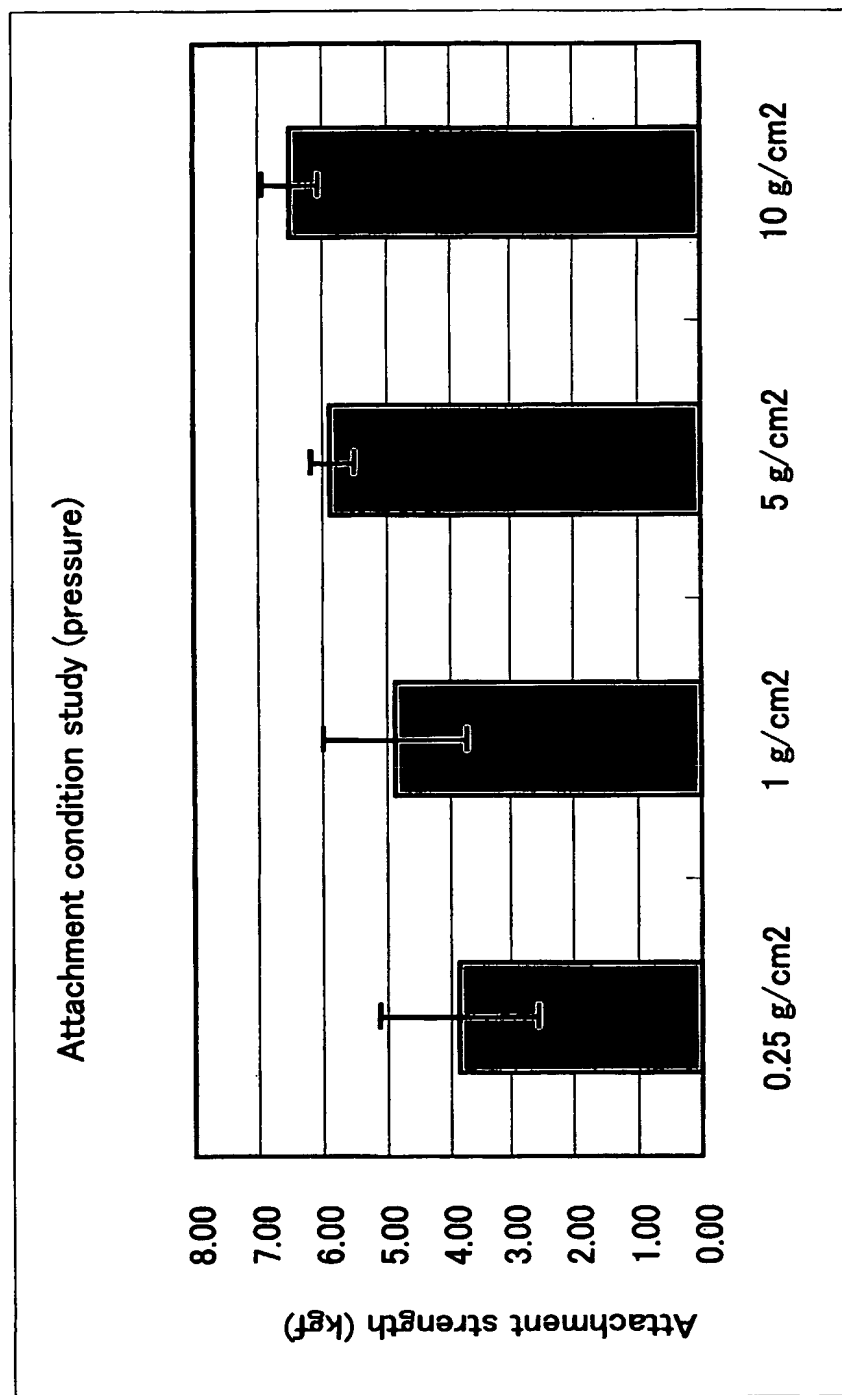
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FIG.29B



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FIG.29C



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FIG.29D

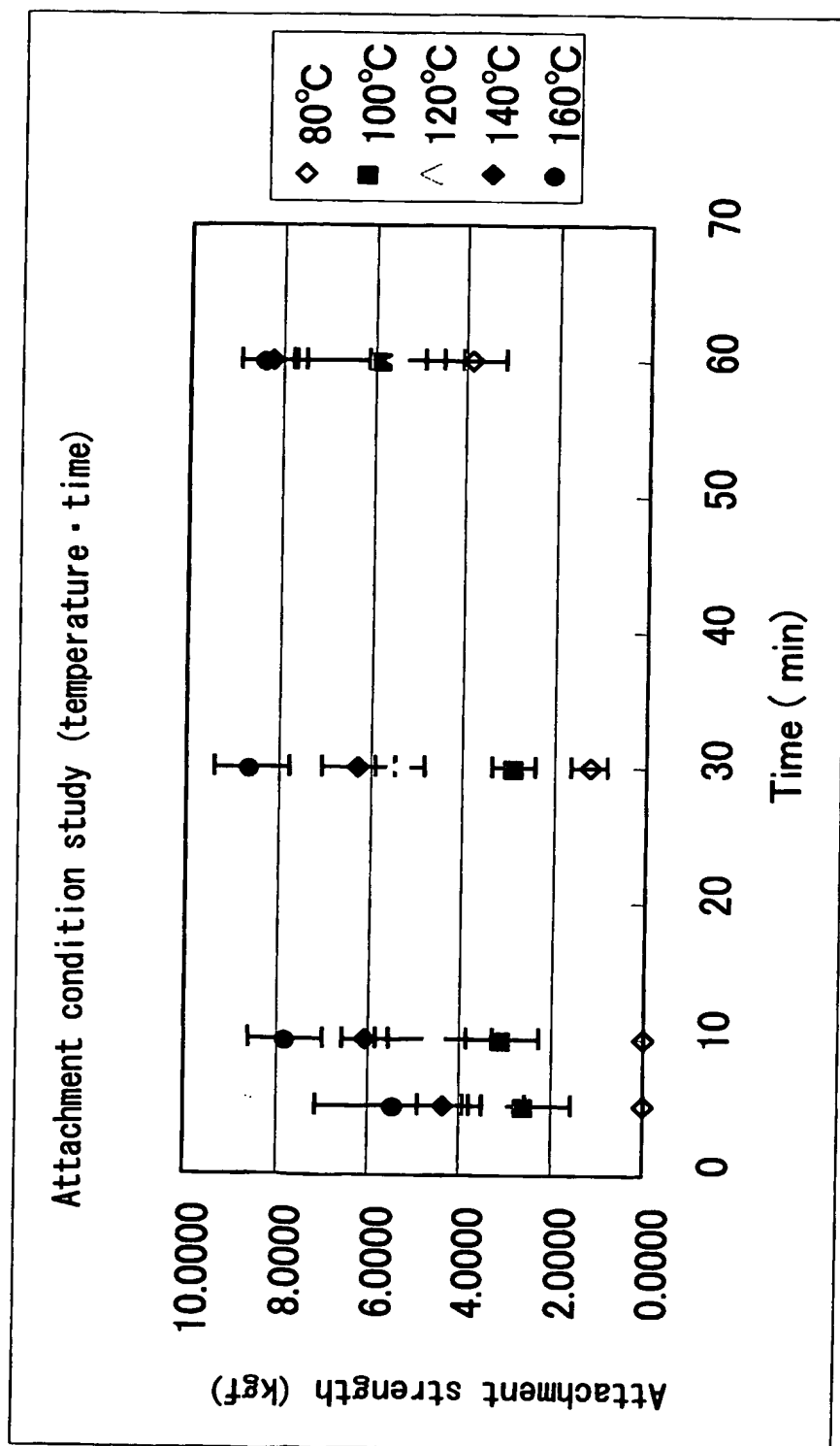


FIG.30

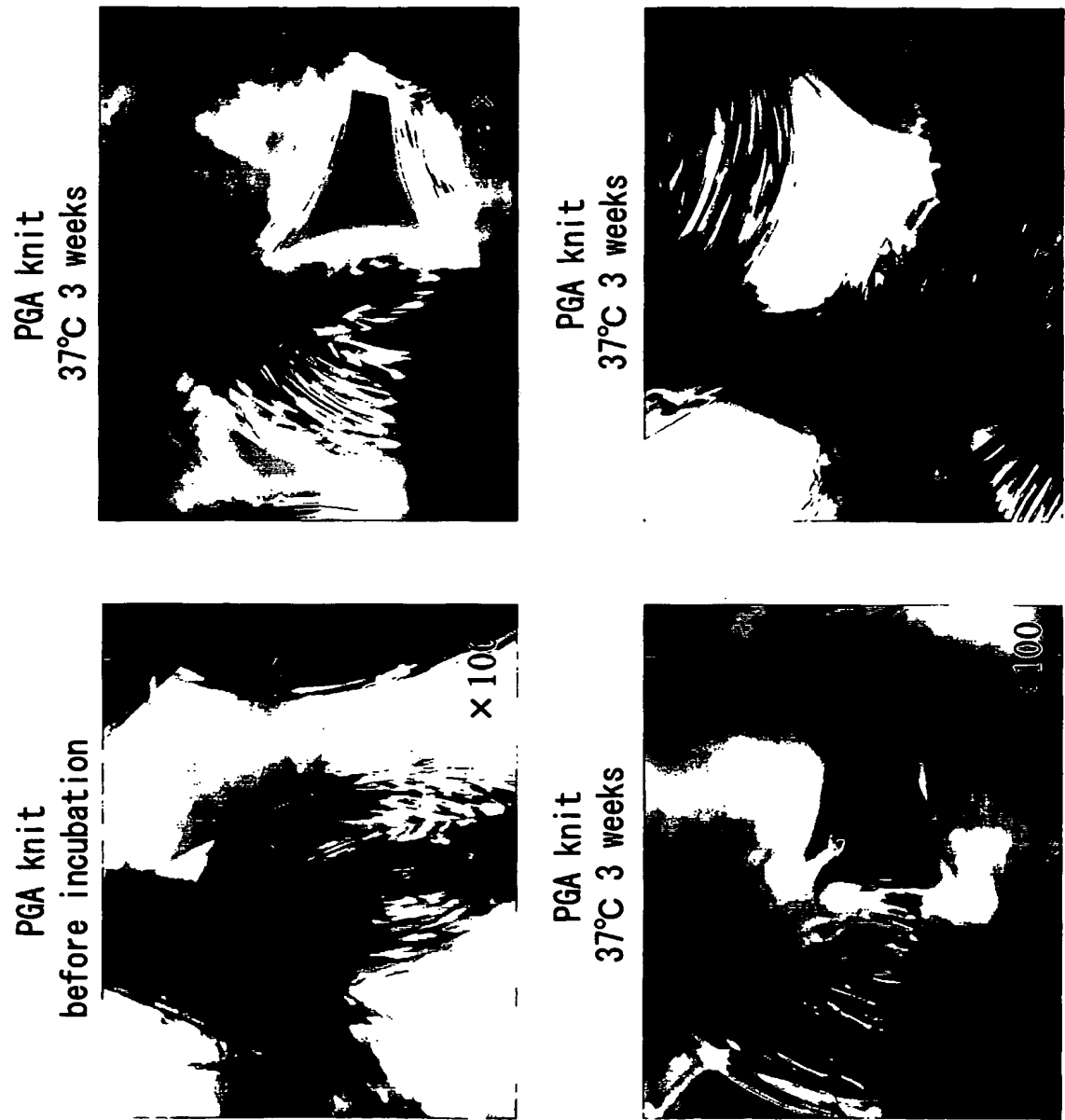


FIG.31

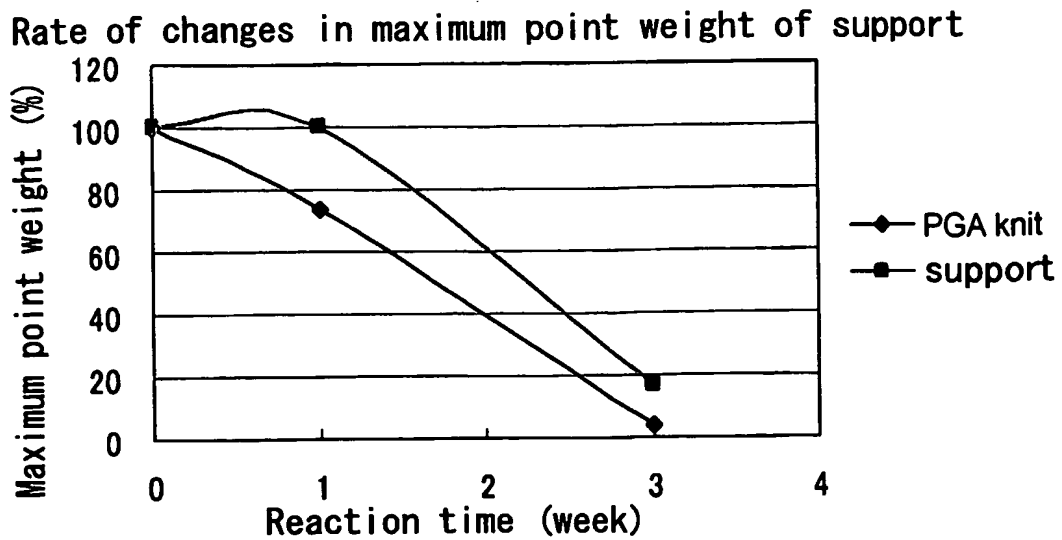
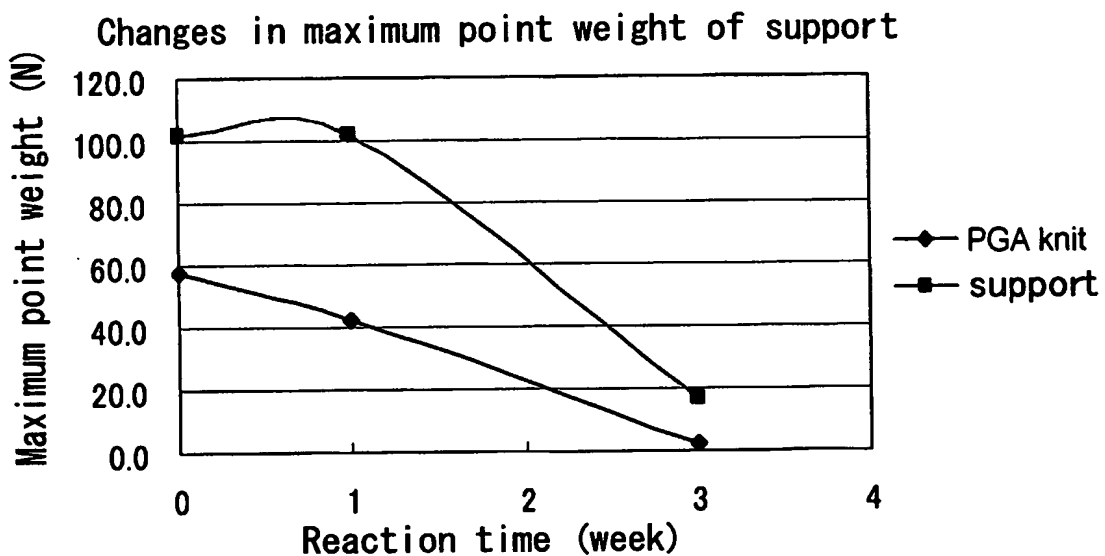
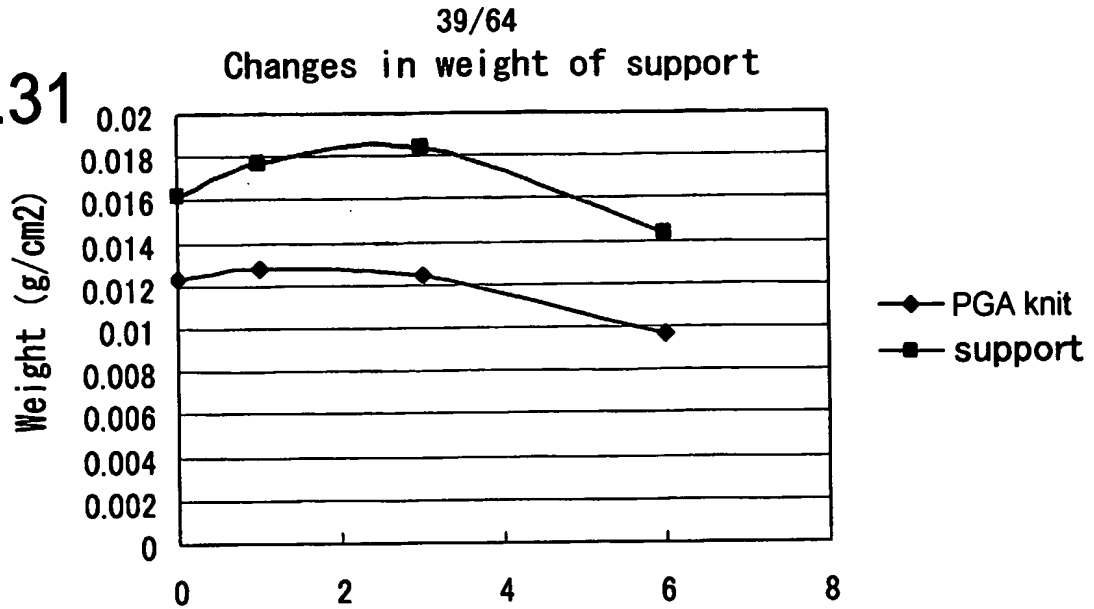
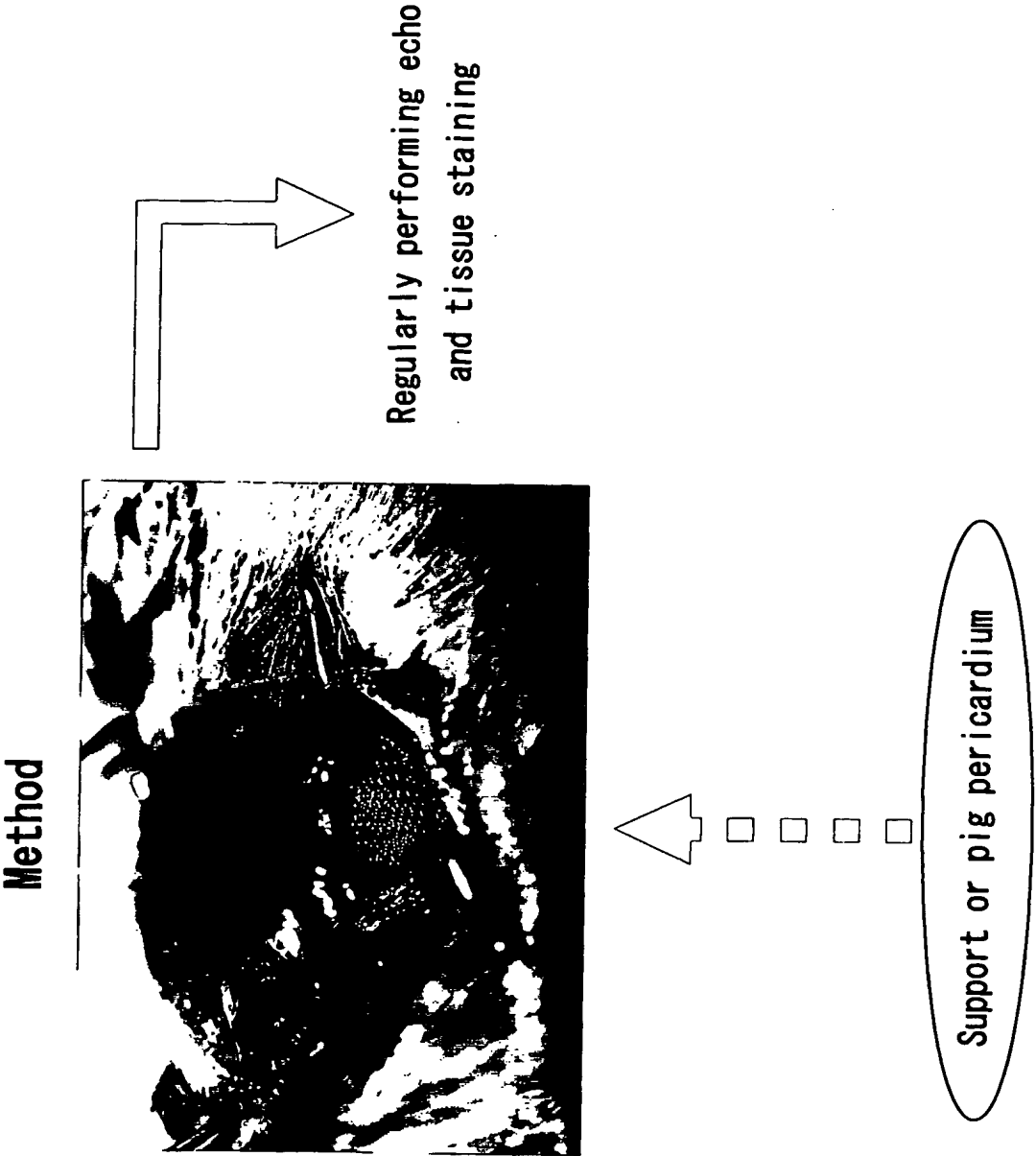


FIG.32



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FIG.33

Rat lig Sham
One month

Extracted sample



HE staining

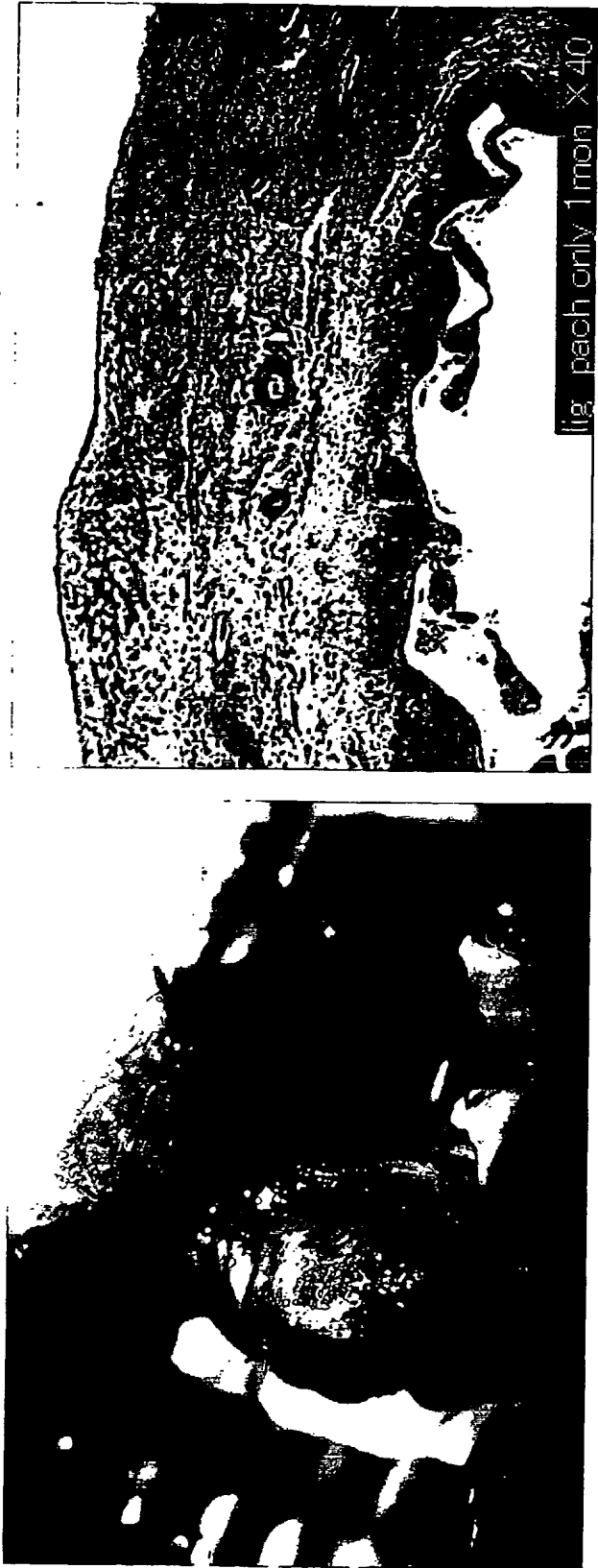


FIG.34

Rat lig patch implantation
One month

Extracted sample

HE staining



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FIG.35

Rat lig patch (collagen I+IV) implantation
One month

HE staining



FIG.37

Implantation into rat myocardial infarction site
(cardiovascular repair material-implanted group)

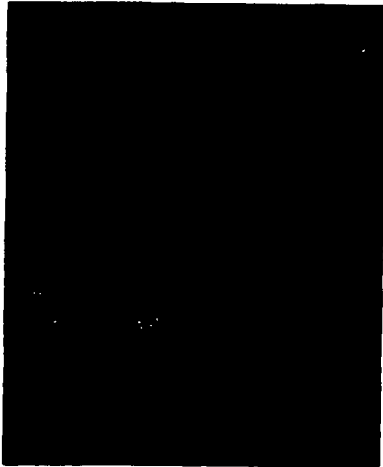
Extracted sample



HE staining



Desmin staining



4 weeks after implantation

FIG.38

Implantation into rat myocardial infarction site (cardiovascular repair material+type I collagen+type IV collagen+laminin-implanted group)

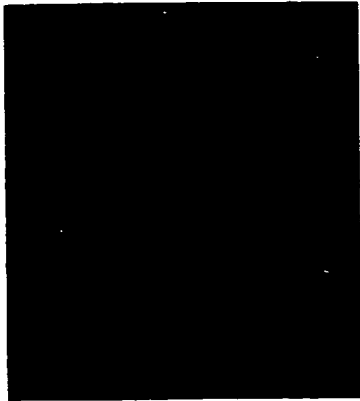
Extracted sample



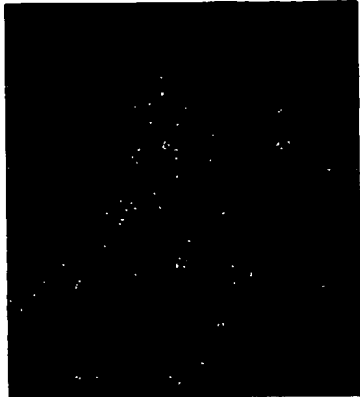
HE staining



Troponin T staining



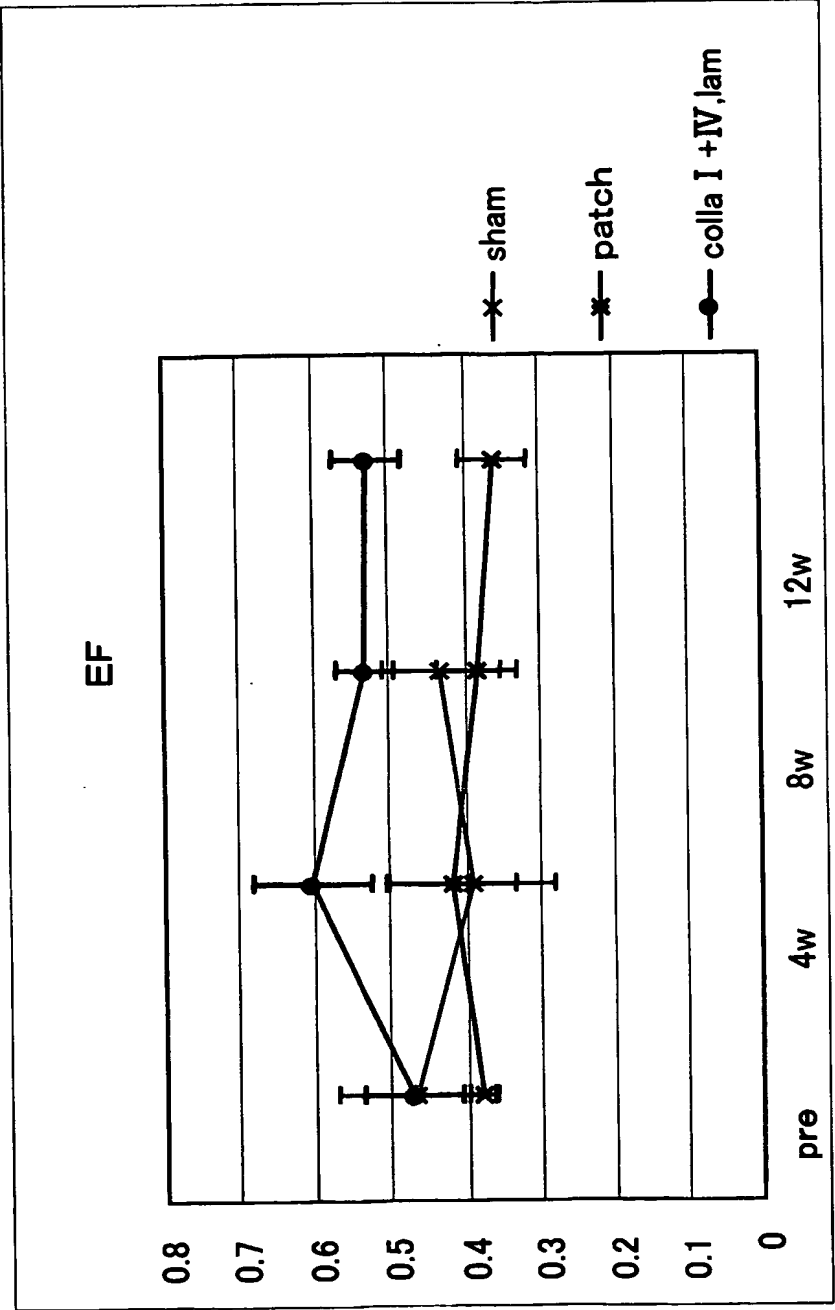
Desmin staining



4 weeks after implantation

FIG.39

Assessment of implantation into rat myocardial infarction site



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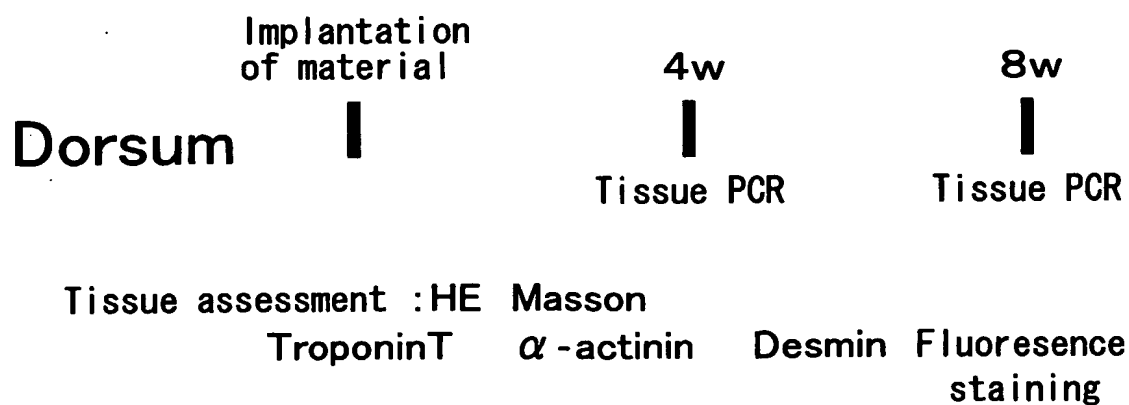
FIG.40

Implantation into the dorsum of rat



Implanted material

- Control patch
- Cardiovascular repair patch (colla I +F-HGF)
- Cardiovascular repair patch (colla I +IV, laminin)



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FIG.41

Implantation into the dorsum of rat
(cardiovascular repair material+type I collagen+HGF group)

Implanted material: PLGA patch (collagen I) \times 100

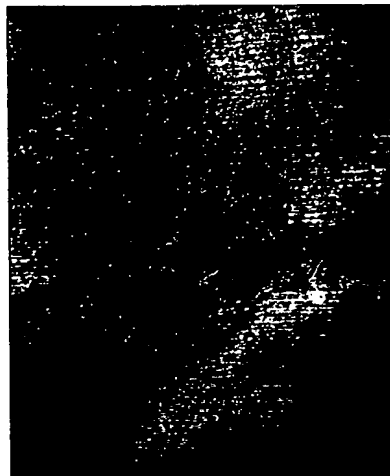
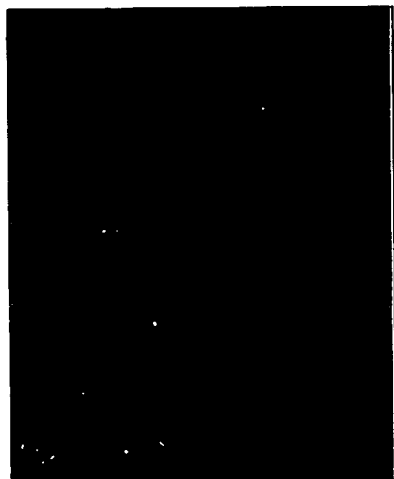
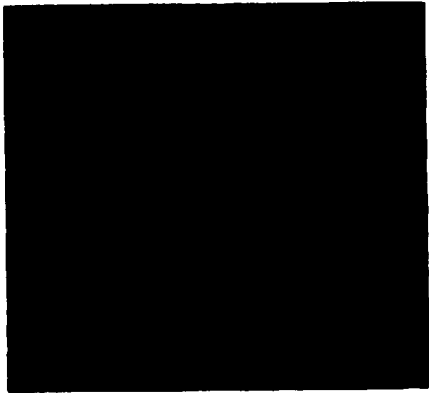


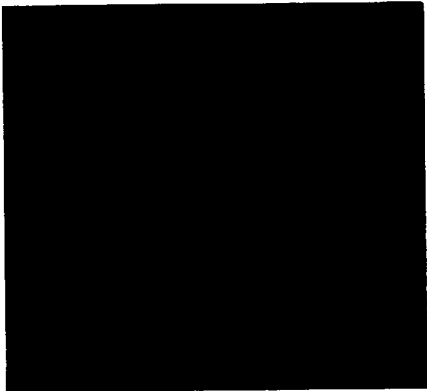
FIG.42

Implantation into the dorsum of rat
(cardiovascular repair material+type I collagen+HGF group)

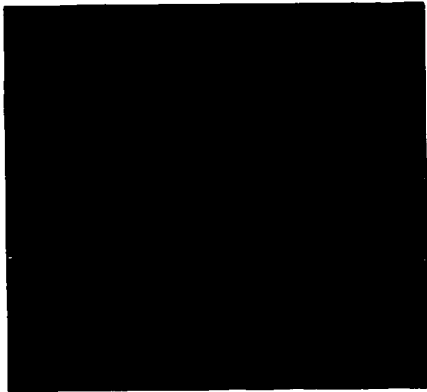
Actinin x 400



TroponinT x 400

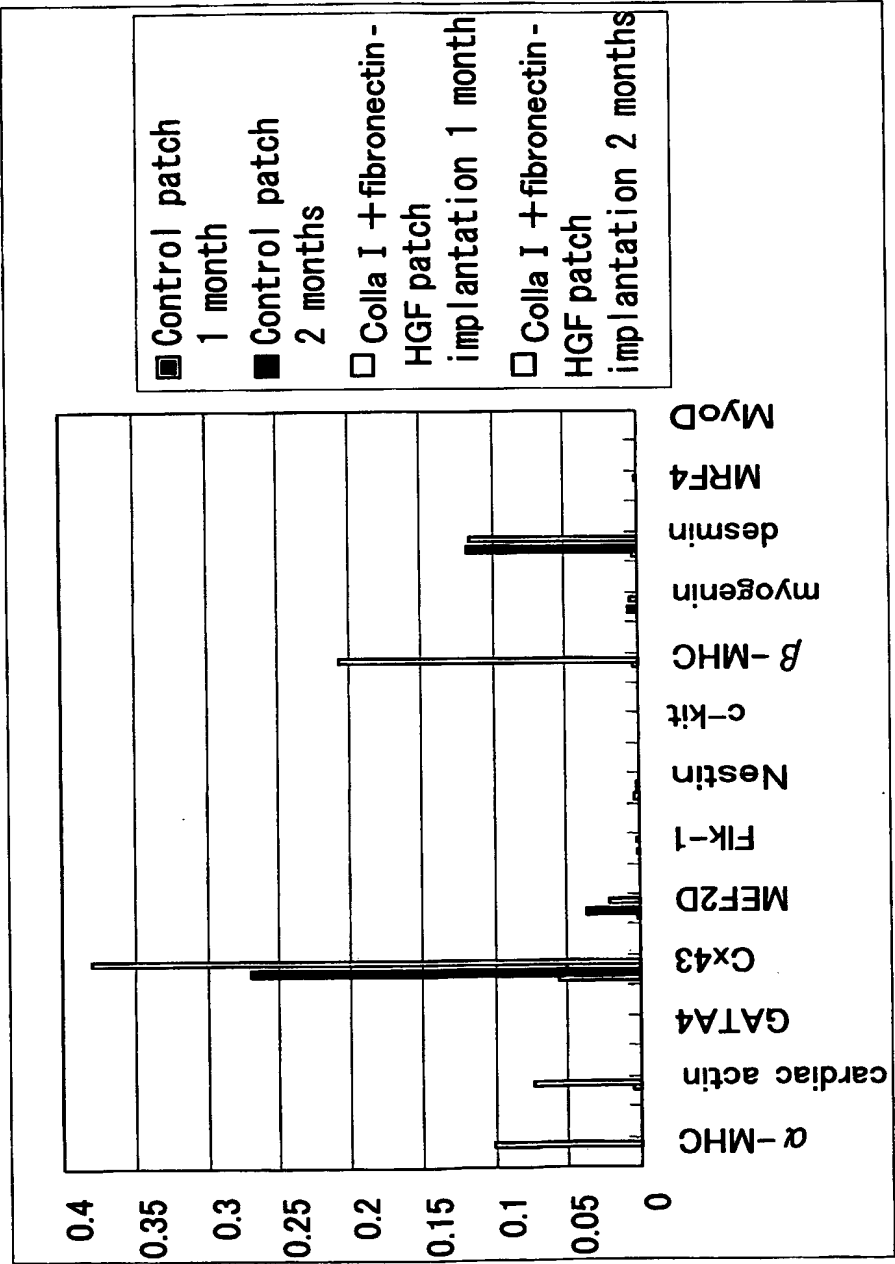


Desmin x 400



4 weeks after
implantation

FIG.43
Implantation into the dorsum of rat
(cardiovascular repair material+type I collagen+HGF group)
real-time PCR



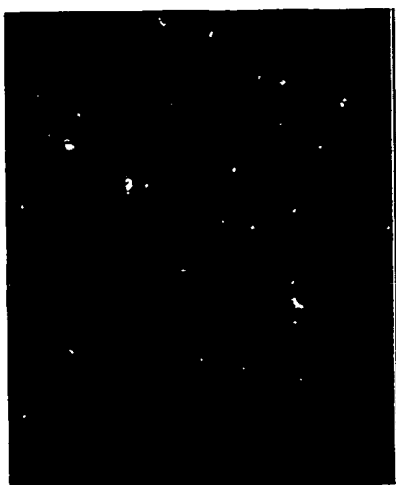
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FIG.44

Implantation into the dorsum of rat (cardiovascular repair material+type I collagen+type IV collagen+laminin-implanted group)

Implanted material: PLGA patch (collagen I+IV, lam) \times 100

Extracted sample



Extracted sample



FIG.45
Implantation into the dorsum of rat (cardiovascular repair material+type I collagen+type IV collagen+laminin-implanted group)

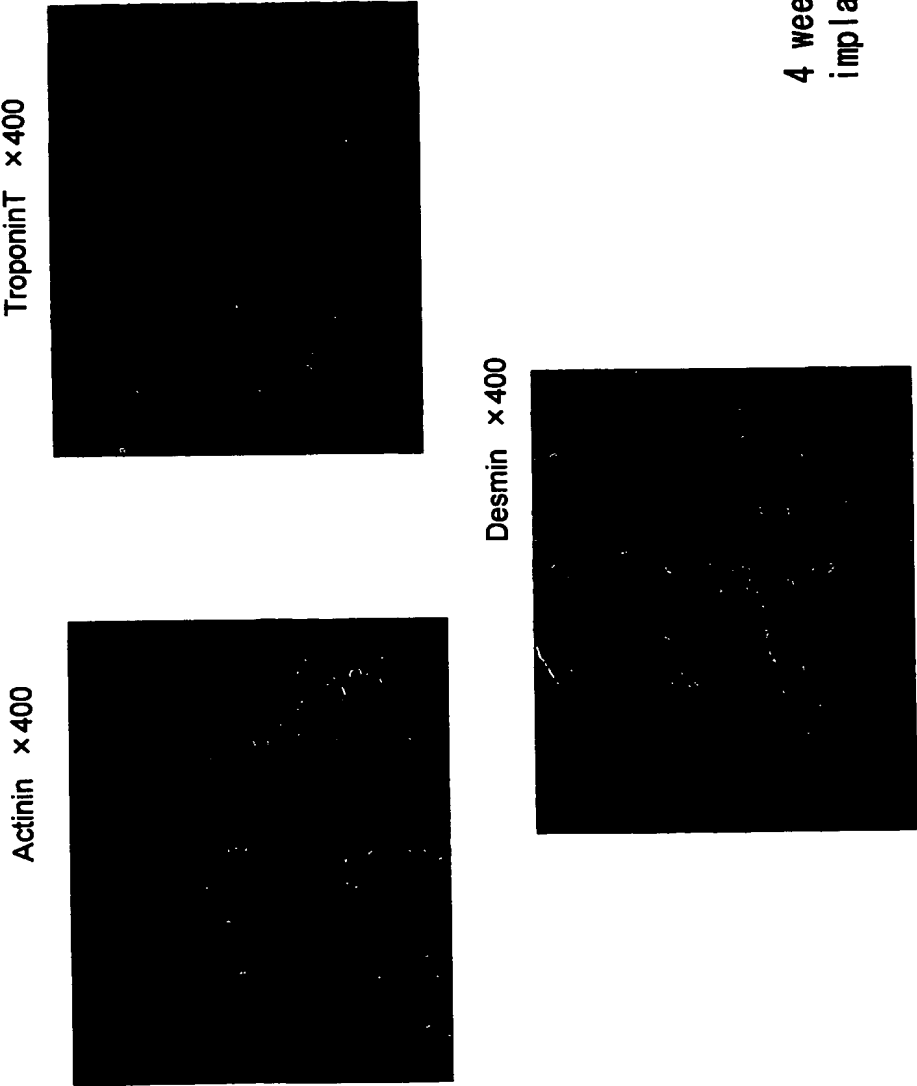


FIG.46

Implantation into the dorsum of rat
(cardiovascular repair material+type I collagen+
type IV collagen+laminin-implanted group)

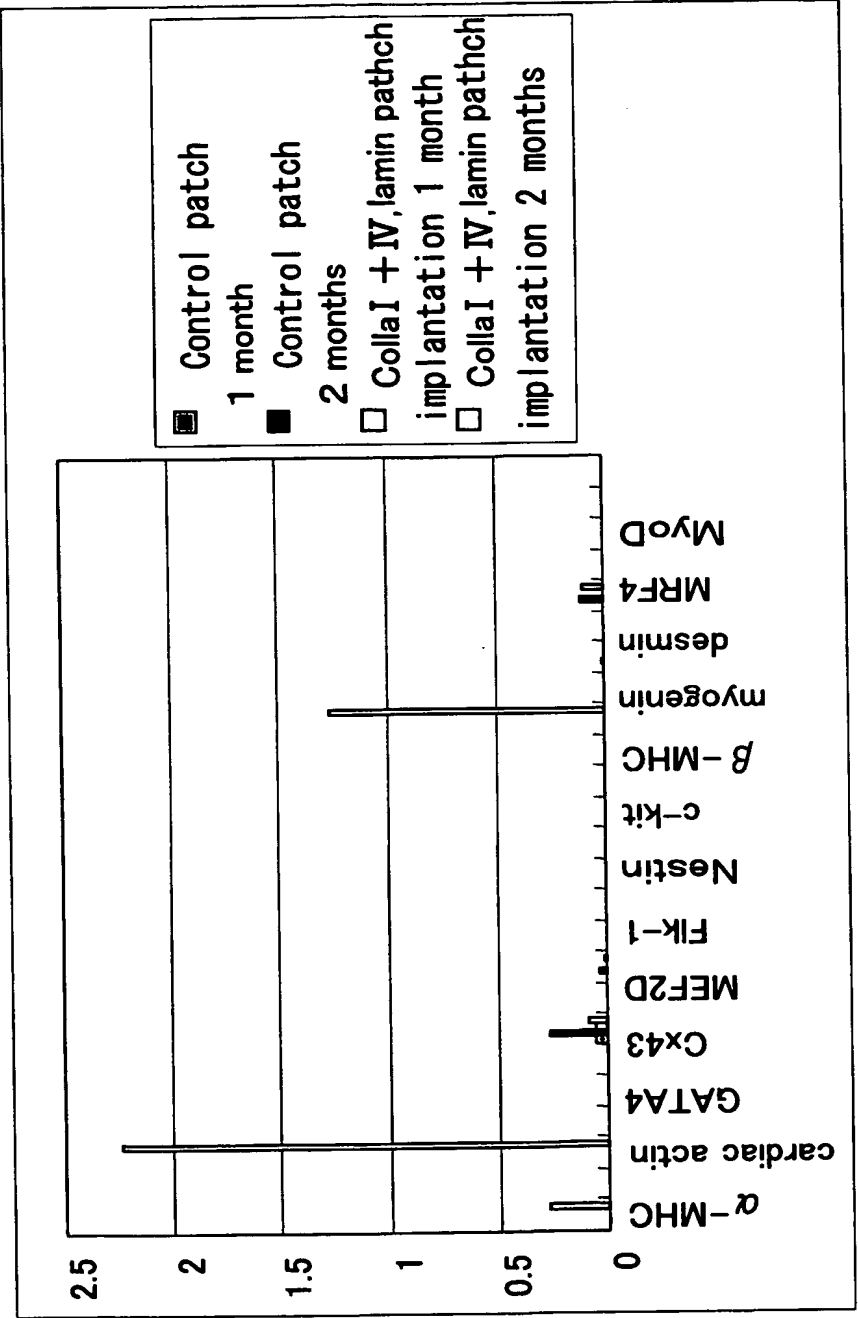
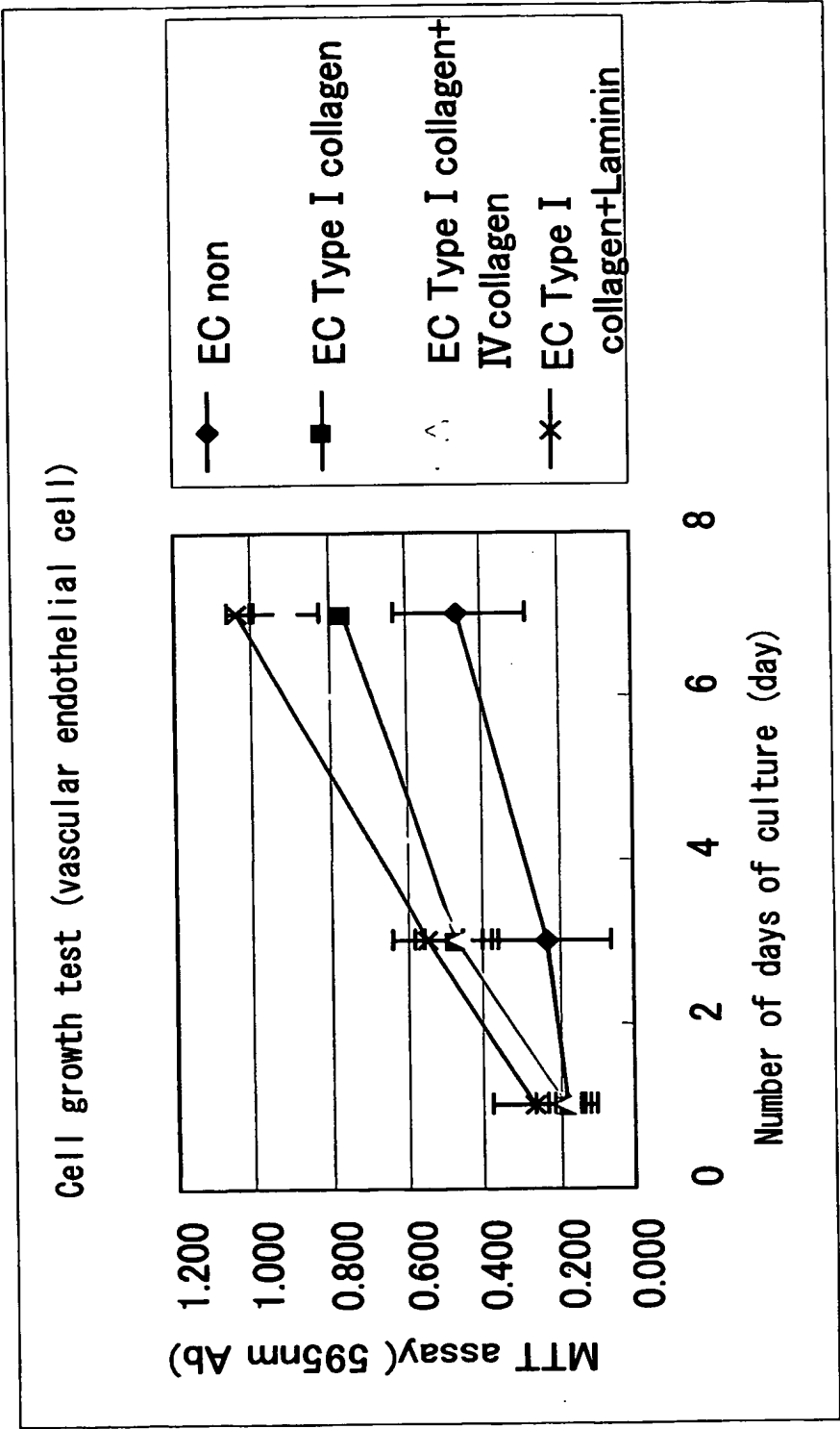
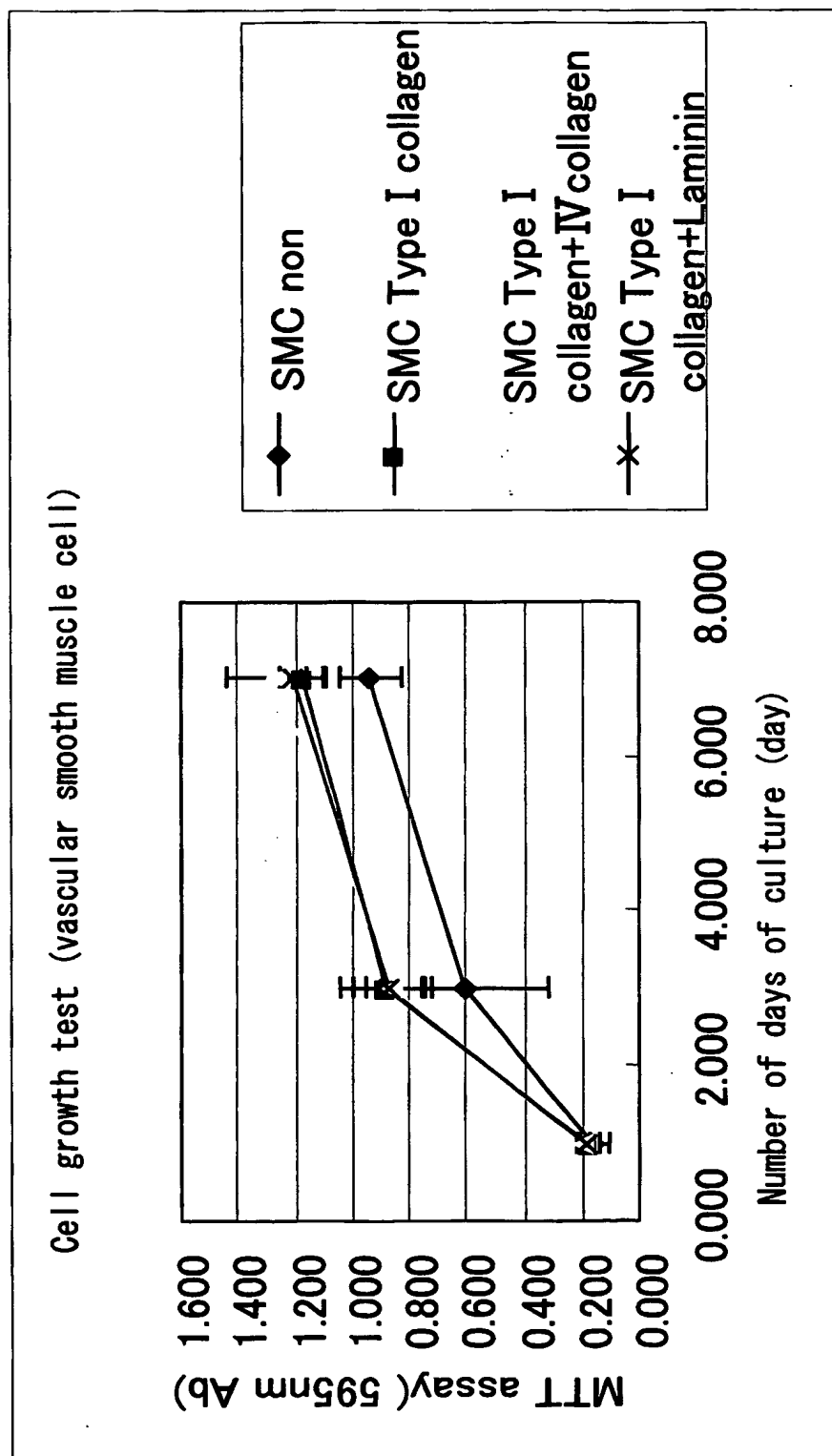


FIG.47



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FIG.48



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FIG.49

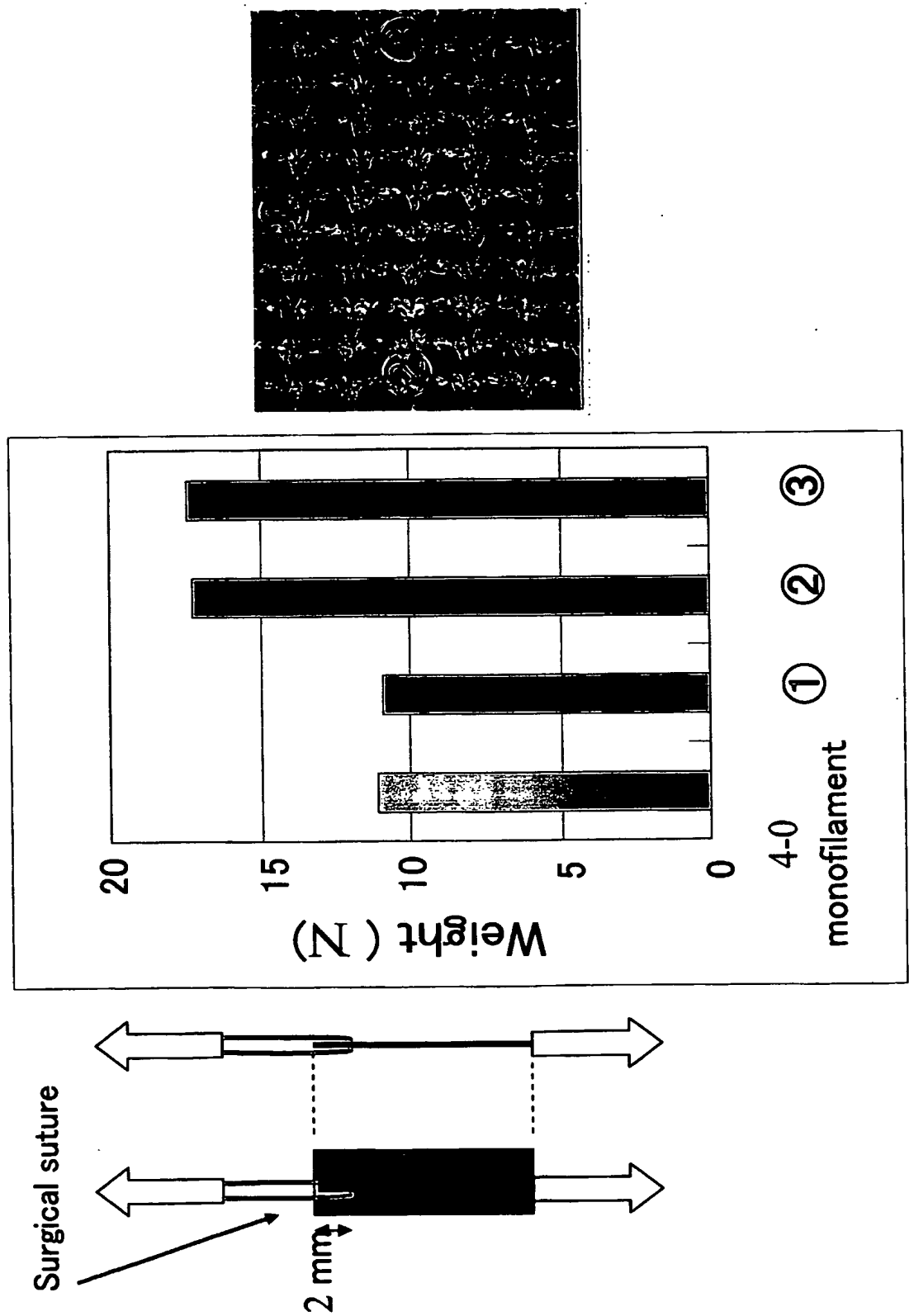
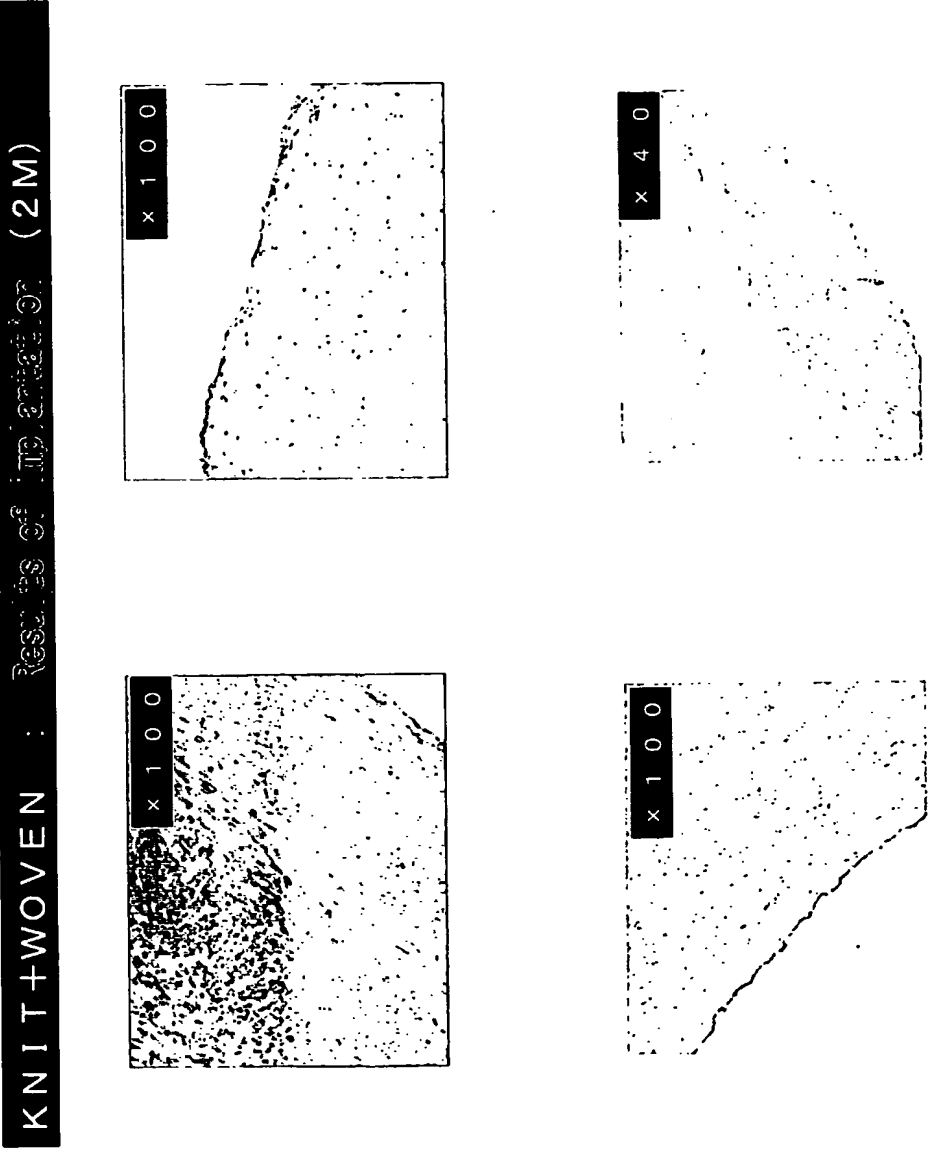
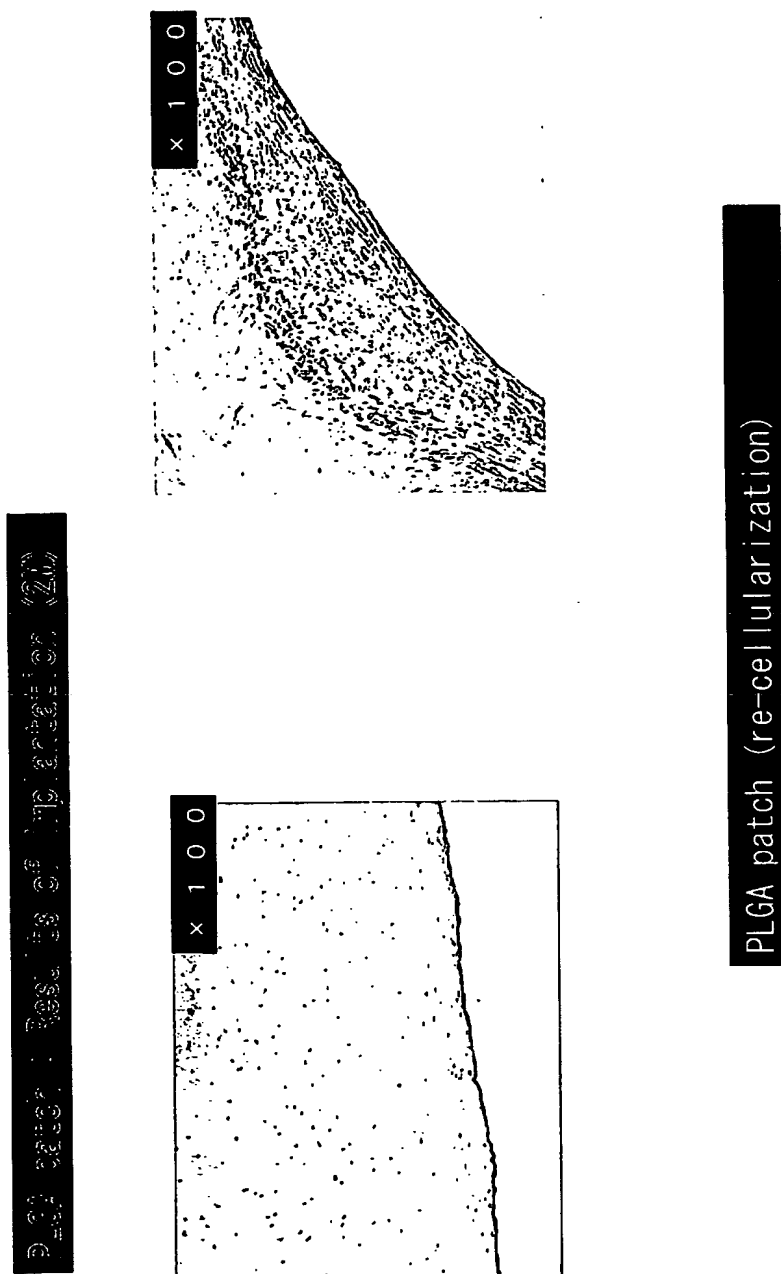


FIG.50



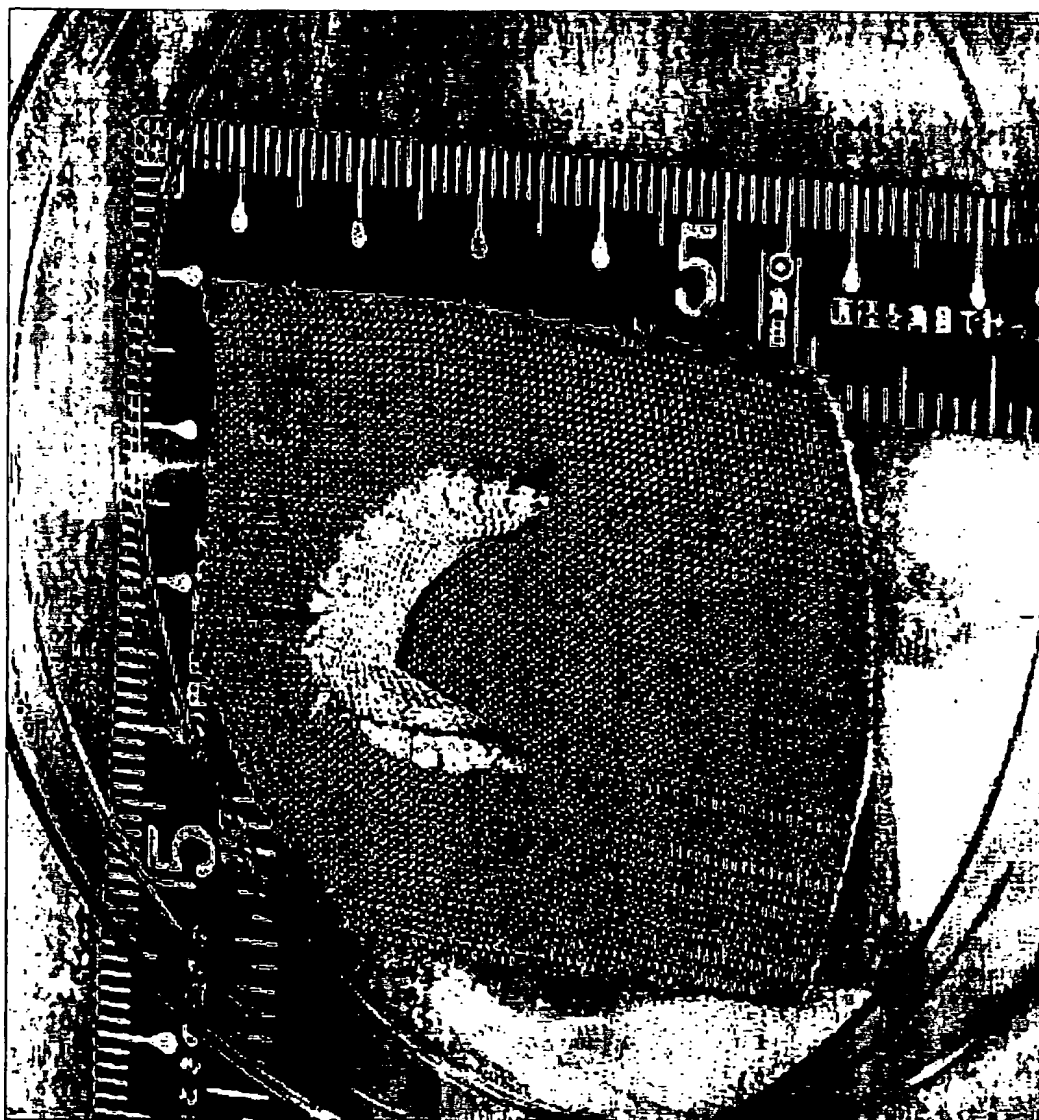
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FIG.51



PLGA patch (re-cellularization)

FIG.52



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FIG.53

FIG.54

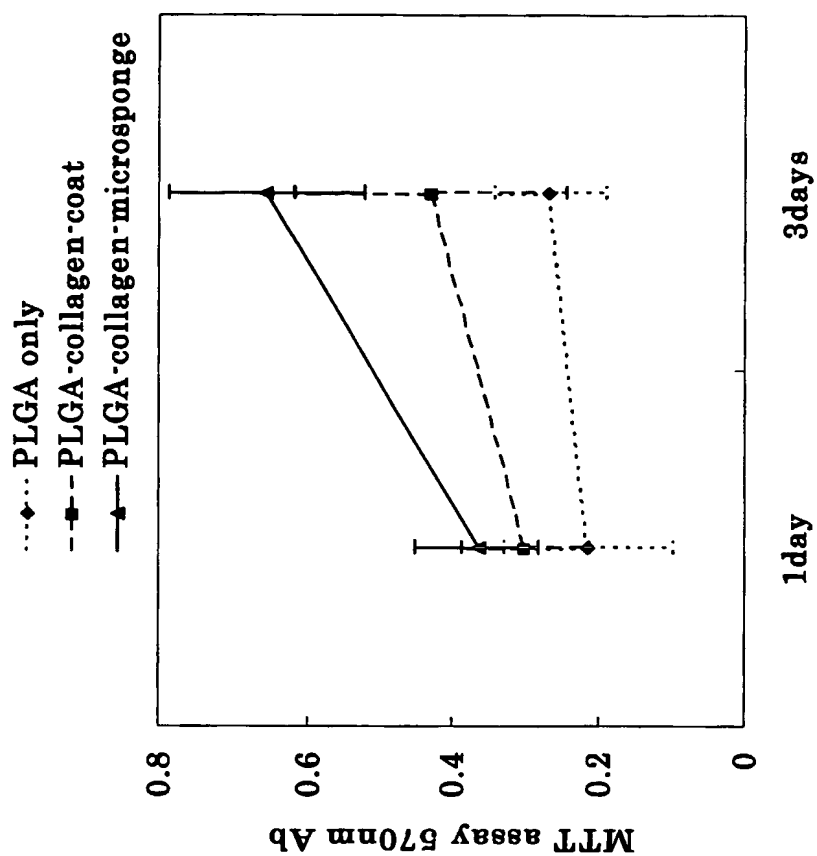
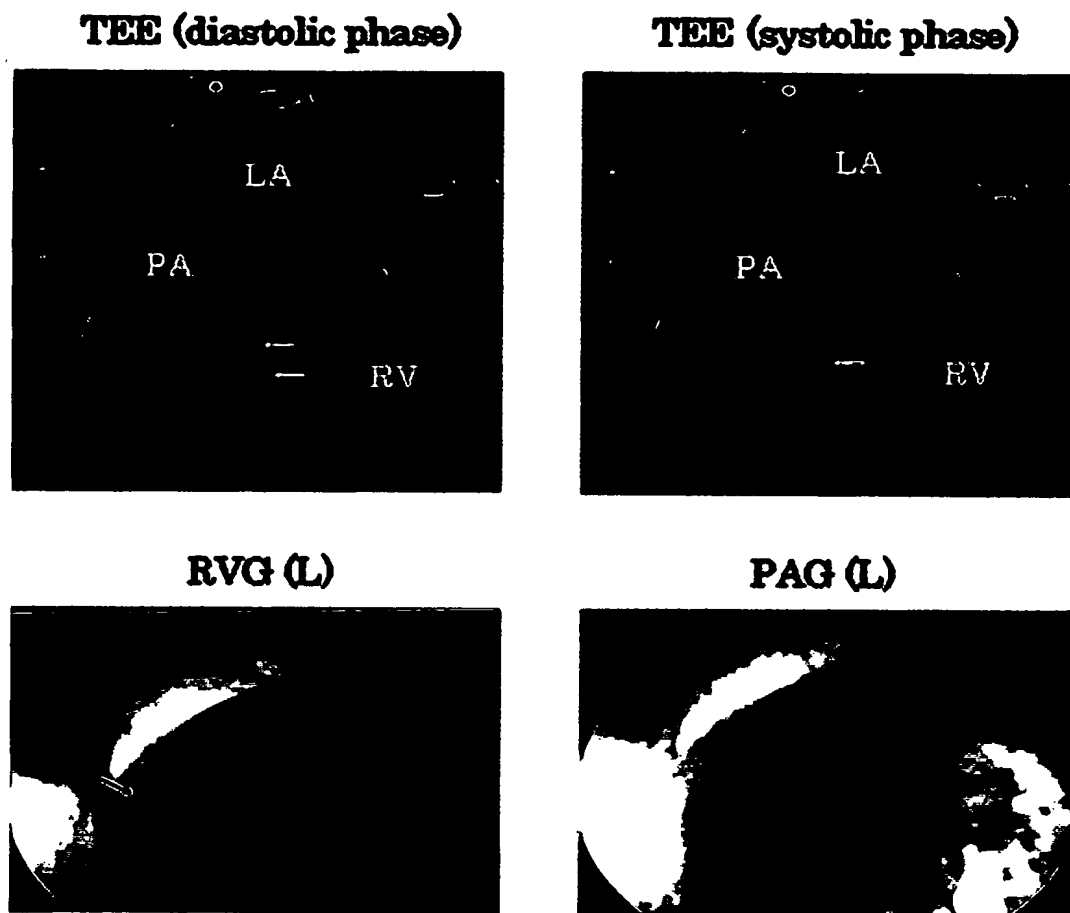




FIG.55

FIG.56



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